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Reports of the Survey, Botanical Series, No. 1.

GEOLOGICAL AND NATURAL HISTORY SURVEY OF MINNESOTA

CONWAY MACMILLAN, *State Botanist*

THE
(METASPERMAE)
OF THE
(MINNESOTA VALLEY)

A LIST OF THE HIGHER SEED-PRODUCING PLANTS INDIGENOUS TO
THE DRAINAGE-BASIN OF THE MINNESOTA RIVER

BY
CONWAY MACMILLAN

REPORTS OF THE SURVEY
BOTANICAL SERIES



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The University of Minnesota, Minneapolis, Minn.
April 29th, 1892.

HON. JOHN S. PILLSBURY,

President of the Board of Regents of the University,

SIR:—I have the honor to present through you to the Board of Regents of the University of Minnesota, my first report as botanist of the Geological and Natural History Survey of Minnesota.

I am, sir,

your obedient servant,

CONWAY MACMILLAN,

State Botanist.

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ERRATA.

- p. 64. For **arundiuacea** read **arundinacea**.
 p. 343. For *presslii* read *preslii*.
 p. 441: For var. **pilosum** read var. **pilosa**.

PREFACE.

The Geological and Natural History Survey of Minnesota is established by virtue of an act of the state legislature, approved March 1, 1872. This act is entitled "An Act to provide for a Geological and Natural History Survey of the State, and to entrust the same to the University of Minnesota." Under the law, therefore, organising the survey, the Regents of the University became its directors and have at different times appointed officers to prosecute the different lines of scientific work. The order of carrying on the work is prescribed in the law establishing it. In accordance with such prescription the geological work has been in progress for twenty years, the zoölogical work for four years, the botanical for two years, and the topographical for one year. Originally the separation of these four lines of work was not formally insisted upon by the Board of Regents and certain botanical and zoölogical brochures have up to this time appeared from the office of the State Geologist. More recently, however, contingencies arose that induced the Board of Regents so to classify the work of the survey that each department should be under the charge of a specialist who might be expected to labor toward the ends defined in the organic law, with greater directness than under the unperfected arrangement. The accompanying work, then, is a report of the botanical division of the survey, and the first volume of the botanical series. It is transmitted in the customary manner.

It is necessary to add in this place a word to what is more fully discussed in that portion of the introductory chapter which relates to nomenclature. The action of the Botanical Club of the American Association for the Advancement of Science, at the meeting in Rochester, New York, during the month of August, 1892, is a very grateful one to all who have wished for some radical reform in our laws and customs of botanical nomenclature. The rules of the Paris Congress have

in general been reaffirmed and the modifications of the code are for the most part improvements. The action of the club certainly marks the end of an unfortunate epoch in the history of American botany, and in the future it may be expected that many and evident benefits will be derived from the establishment of nomenclature upon some other than a personal basis.

In accord with the action of the Botanical Club, I should have adopted in this work the 1753 date for genera as well as for species, had not most of the pages been in type when the action was taken. In accordance with the new rule the following changes in generic nomenclature are suggested to persons using this volume.

- Mariscus* HALL. (1742) = *Cladium* P. BR. (1756).
Cyperella CRAM. (1744) = *Juncodes* ADANS. (1763).
Ramium RUMPF. (1747) = *Boehmeria* JACQ. (1763).
Stellularia LINN. (1748) = *Stellaria* LINN. (1753).
Leuconymphaea LUDW. (1737) = *Castalia* SALISB. (1805).
Nymphaea LUDW. (1737) = *Nymphaea* SALISB. (1805).
Capnorchis LUDW. (1737) = *Bikukulla* ADANS. (1763).
Cracca LINN. (1747) = *Colonila* ADANS. (1763).
Ricinocarpus BURM. (1737) = *Acalypha* LINN. (1753).
Stellaria LUDW. (1737) = *Callitriche* LINN. (1753).
Lappula HALL. (1745) = *Lappula* MOENCH. (1794).
Leptostachya MITCH. (1748) = *Phryma* LINN. (1753).
Pentagonia SIEG. (1737) = *Legouzia* DUR. (1782).

In the spelling of generic names the following are the preferable forms: *Cypripedium*, *Pyrus*, *Pyrola*, *Pentstemon*. In the matter of specific nomenclature the only change that need be made to follow the rules of the Botanical Club is the substitution of the second oldest specific name in the duplicate binomials. *Phragmites phragmites* (LINN.) then becomes *Phragmites vulgaris* (LAM.). While the writer is not at all in sympathy with this rule of the Botanical Club, which makes an exception to the law of priority of which no exception should under any circumstances be allowed, nevertheless, in accordance with his belief that the action of so representative a body of botanists should have its due weight, he suggests that this change be made in the duplicate names of the list.

It has been intimated that the position of the *Characeae* is not apparent in the general scheme of arrangement proposed in the introduction. It seems clear to the writer that this group is to be included among the Sporophyta-Archegoniatae. Whether the sporophytic plant is represented by the so-called pro-embryo¹ or is altogether suppressed, it would seem proper to include the *Characeae*, as has been done, among the Sporo-

1. Vines: Journ Bot. (1878).

phyta. An extended discussion of the point will not be proper here, but it may be noted in passing that the proposition that the pro-embryo of *Chara* is really homologous with a sporophytic plant is not altogether indefensible.

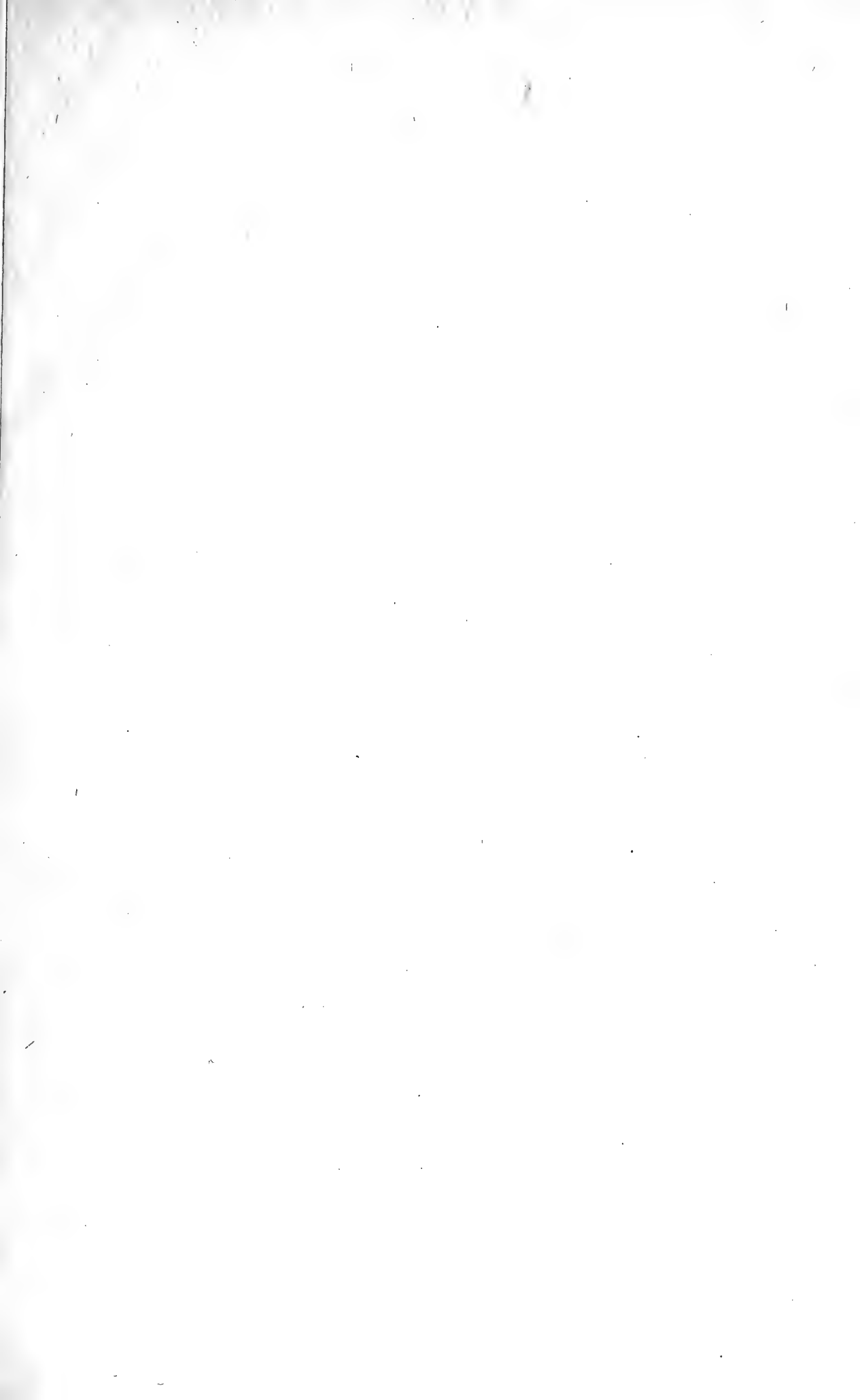
Acknowledgements not already made in the introductory chapter may here find an appropriate place. To very many I am under grateful obligation for assistance and encouragement. I may name most particularly Dean C. W. Hall, of the University of Minnesota; Dr. N. L. Britton, of Columbia College; Prof. E. L. Greene, of the University of California, and Dr. C. E. Bessey, of the University of Nebraska. Each one of these has aided me and I take pleasure in assuring them of my sincere gratitude and regard. I am also indebted to Maud R. MacMillan, my wife, for no little help in the proof-reading and indexing-work, and to my sister, Bertha MacMillan, for similar kindly offices. I extend my thanks to them.

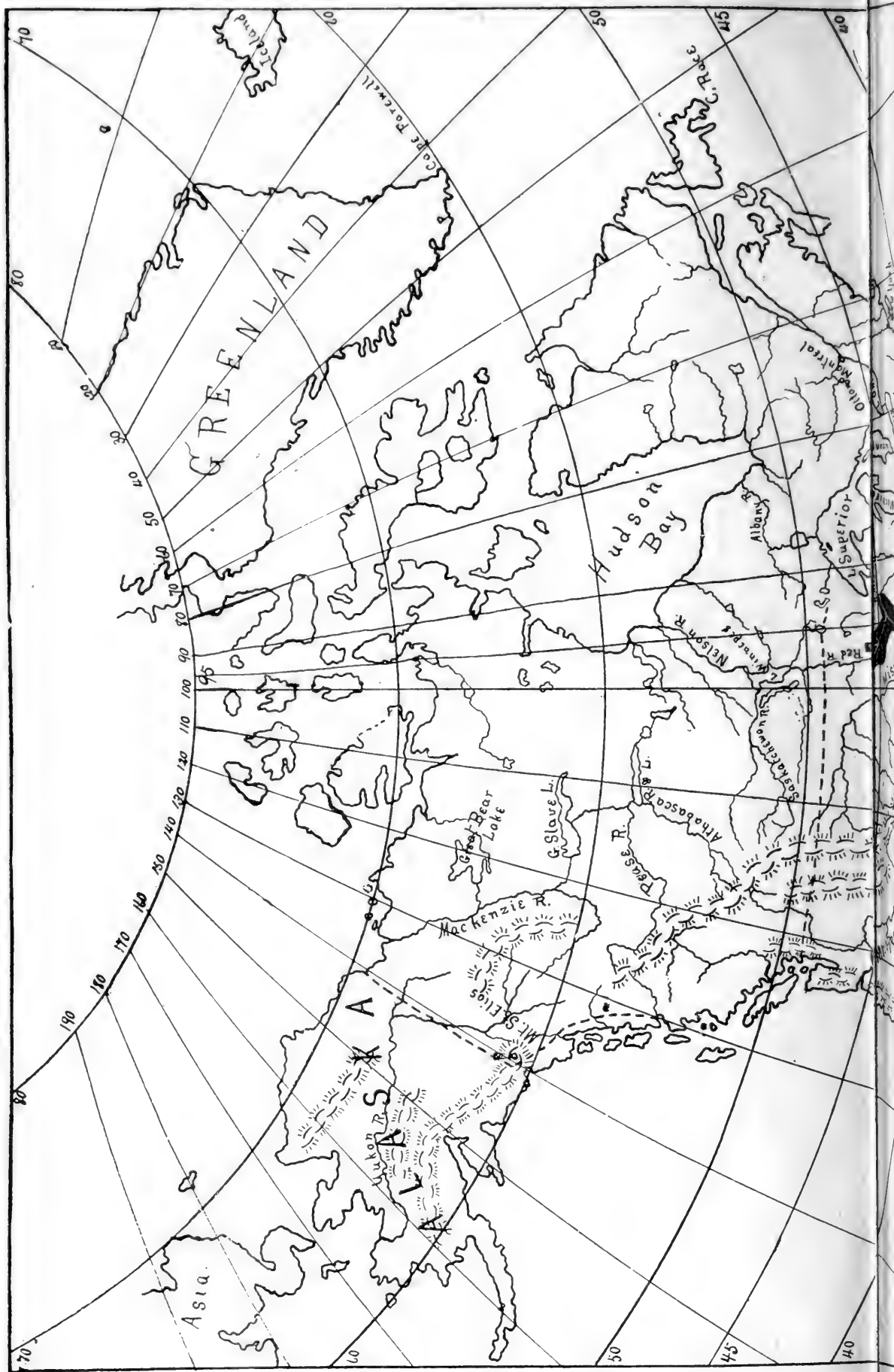
The general plan of this volume will be recognised by my professional co-workers as somewhat new, or at least untried. They will doubtless appreciate without any further statements on my part, the many difficulties that confront one who attempts to follow such a plan. I trust they will also bear in mind that the writer is keenly aware of many defects in his work, and doubts not that there are others which have escaped his attention. Oversights, errors and positive blunders are scarcely to be avoided in any work that is made up of such a mass of detail as in the case in hand. I hope, however, that these errors have been reduced to a minimum, and that such as exist, in spite of what I trust has been a due degree of watchfulness, will not mislead anyone who may use this book. In spite of the onus that to a certain degree rests upon the compiler of a local flora, I believe that even in such a humble department of botanical science there is opportunity for useful study. Where the present work may have failed, others, it may be hoped, will succeed, and, if directly or indirectly the writer has contributed a little to the development of our knowledge of the plant population of the continent, he will feel well repaid for labors which have at times been both arduous and confining.

CONWAY MACMILLAN

University of Minnesota

December 24, 1892





**GEOLOGICAL
AND
NATURAL HISTORY
SURVEY
OF
MINNESOTA.**

Conway MacMillan,
STATE BOTANIST.

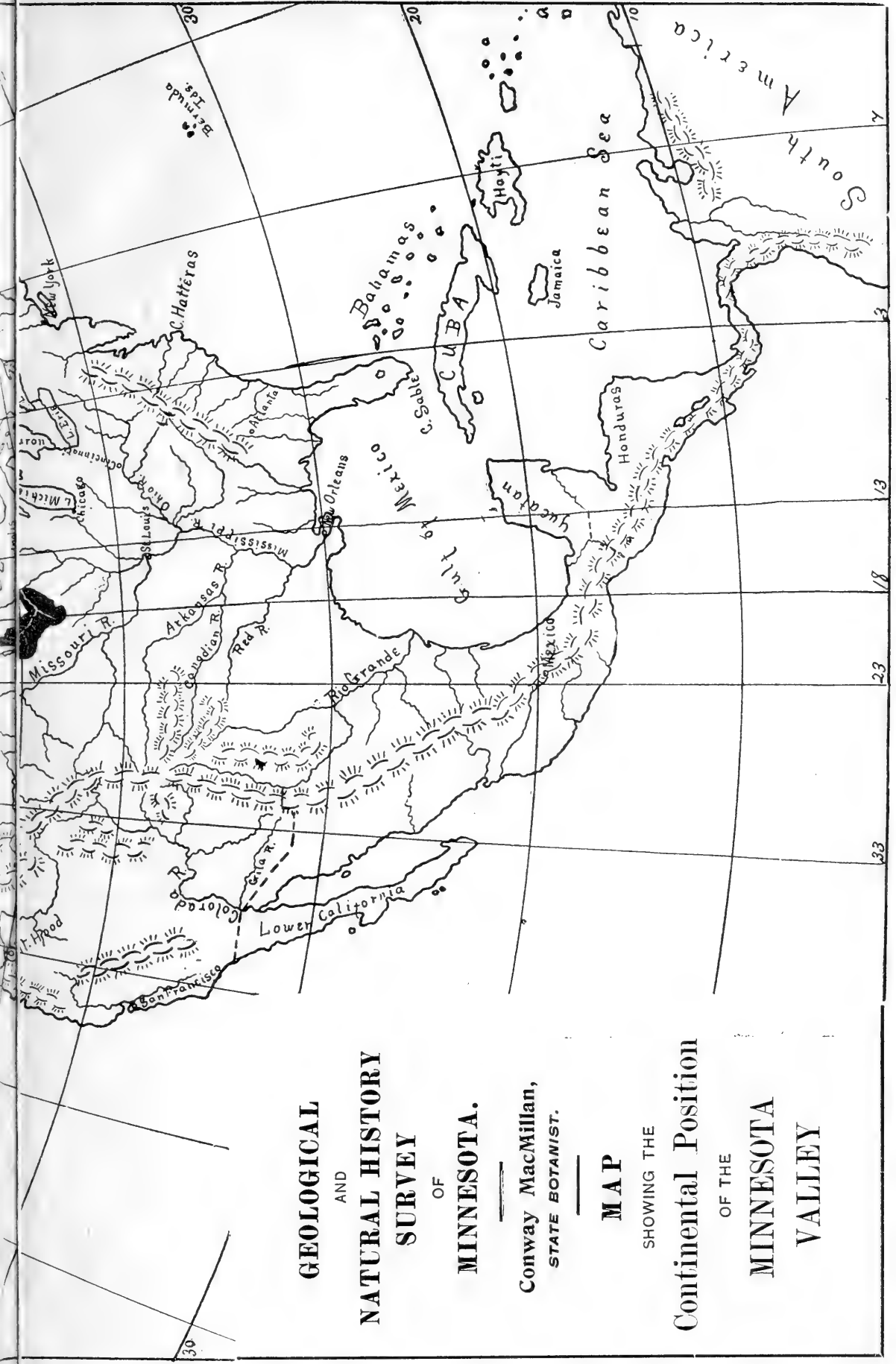
MAP

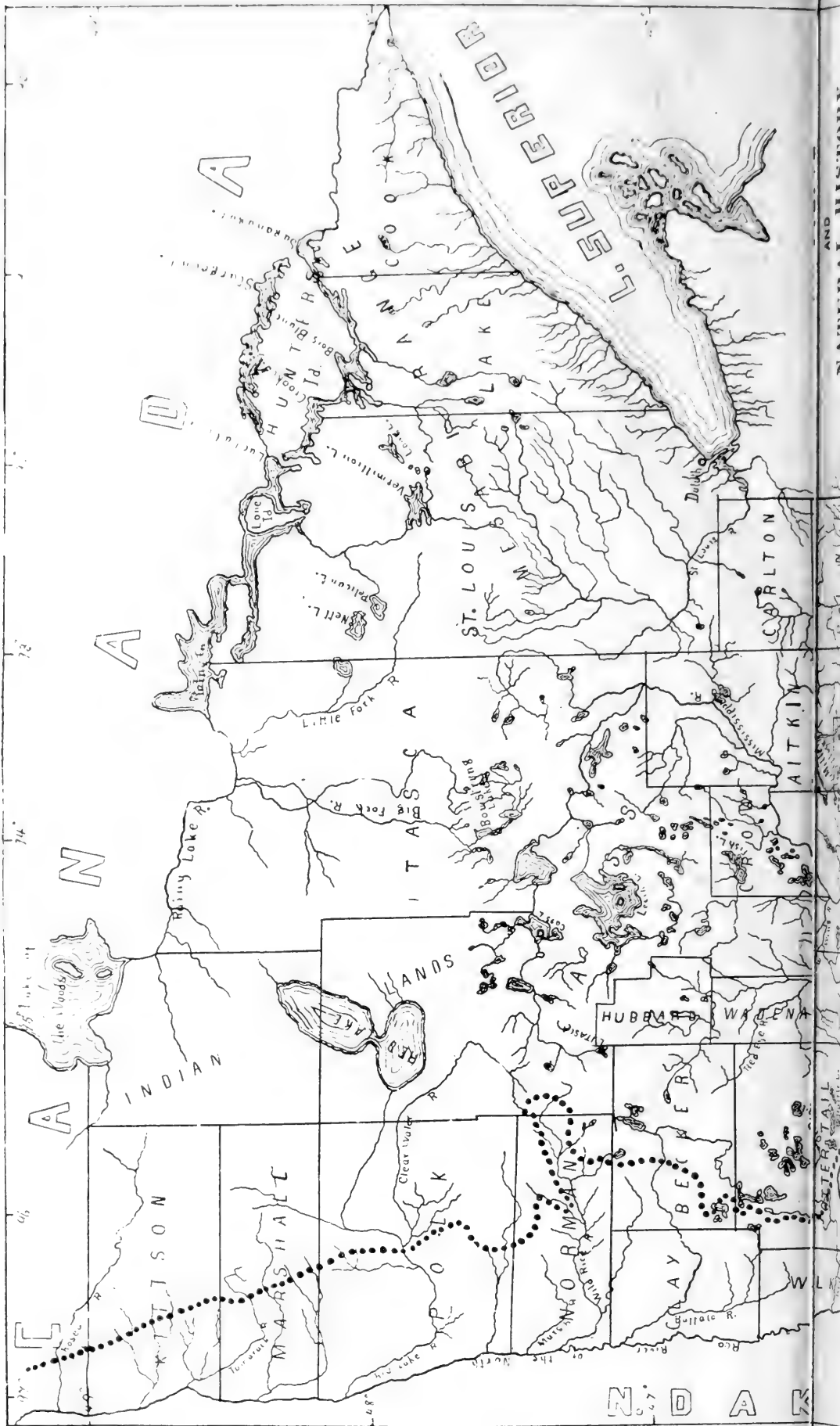
SHOWING THE

Continental Position

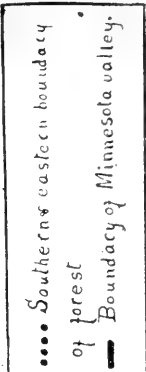
OF THE

**MINNESOTA
VALLEY**





MAP OF MINNESOTA
SHOWING THE
POSITION
OF THE
MINNESOTA VALLEY



INTRODUCTION.

The work of a Botanical Survey. In the law of March 1st, 1872, providing for a Geological and Natural History Survey of Minnesota, it is directed that an examination of the vegetable productions of the state, embracing all trees, shrubs, herbs and grasses, native or naturalised, shall be included in the said survey. It is furthermore provided that, under the supervision of the Board of Regents, who, by law, are constituted the Directors of the survey, reports shall from time to time be made to the people of the state, and suitable provisions are determined for the distribution of these reports. A task of considerable magnitude is thus laid upon the officers of the survey in whose charge the botanical work is placed. Not only must those conspicuous members of the vegetable kingdom—the flowering plants, pines and ferns—be subjected to examination; but the less prominent and lower forms, such as the fungi, algae, lichens, bacteria, slime-moulds and problematic organisms, must receive what may seem to be their due share of attention. These latter forms from their intimate connection with the health, nutrition and activities of man may rightly claim a careful study. But up to the present time very little is known of the lower plant forms as occurring in Minnesota. In the catalogue prepared by A. E. Johnson, and published most fully in the Bulletins of the Minnesota Academy of Sciences, there will be found the first serious effort to bring together into a list some information concerning the fungi of the state (1). In Bulletin No. 3 of the Geological and Natural History Survey of Minnesota, Mr. J. C. Arthur, assisted by Messrs. Warren Upham, L. H. Bailey, E. W. D. Holway and others, presents the results of a brief but fruitful collecting trip in northern Minnesota, together with a number of notes compiled from various sources (2). In this

(1). **Johnson:** Bull. Acad. Sci. Minn., Vol. I. (1877-78-79).

(2). **Arthur:** *Results of Botan. Work in Minn. for 1886.* Bull. Geol. and Nat. Hist. Survey, No. 3. (1887).

list there will be found reference to many of the lower plants, but the number here determined can hardly represent more than a small fraction of all which certainly exist within the limits of Minnesota.

During the three years of 1889, 1890 and 1891, the collection of data in this comparatively unexplored region has been diligently prosecuted by the Botanical Department of the University of Minnesota, and the information thus obtained has become the property of the survey. It is intended at some time in the future, barring unforeseen contingencies, to present as complete a list as possible of the fungi and algae of the state. While this reconnoissance has been in progress much labor has been expended upon the enlargement of our knowledge of those plant-groups which have already commanded, from their greater prominence, the attention of students of the Minnesota flora. Owing to the changes in nomenclature and the never-finished revision-work which modifies our conception of genera and species as well as of the larger divisions, and in the light of constantly advancing scientific knowledge, there is brought near to us the necessity of re-examining somewhat of the botanical work already done. By such examination it alone becomes possible to present the most modern aspect of such a study as is, under the law, directed towards the vegetable products of Minnesota.

In the present volume a mass of revisional and considerable new material bearing upon the plants of Minnesota has been collected. For a proper limitation of the work within bounds a natural group of plants—the higher seed-plants, or metaspermae—has been selected, and these plants have been considered with reference to a limited, but natural portion of the total area of the state. In this way new facts are conveniently grouped and the old facts are brought into a somewhat different angle of vision.

The importance of studying a natural area. It is not commonly the custom of those who compile local floras to select districts limited by nature rather than by man, as the area for investigation. It is far more usual for some political district to be chosen, such as, for example, a group of states, a single state, a county, a town or a region within a circle drawn with arbitrary radius around some central city, lake or valley. In a list of local floras published in North America (3), Dr. N. L. Britton enumerates 791 titles of works that have been published since

(3). **Britton:** *A list of State and Local Floras.* Contr. Col. College Herb. (1890.)

the early colonial days. These fall into three classes, political, geometrical and natural, with reference to the areas of which they treat. To political areas 590 titles are referred, upon examination of the whole list; to geometrical, 142 titles and to natural areas only 59 titles. The more popular methods do not, however, afford so good a field for scientific grouping of facts nor do they permit, without a most tedious and pains-taking tabulation and criticism, any particularly useful generalisations which might be based upon the facts when properly arranged. For there is, apparently no very close connection between those conditions which govern the boundary-lines of a political district and the distribution of plants within those boundaries. The boundaries of Minnesota are certainly not accidental, but have been fixed through the interaction of a complicated series of causes and events, many of them too subtle and elusive to permit of classification. Just as certainly the kinds of plants in Minnesota, their relative abundance or scarcity, their positions in forest, lake or meadow, their general or local distribution are determined by a similarly complicated and interlocking series of causes and events, many of which will also, it is probable, be found to be too difficult and hidden for successful analysis. In the effort to unravel somewhat of the problems suggested, it is necessary that attention should not be diverted to something quite extraneous or superficial and, therefore, just as we should not attempt to interpret the laws governing the action of a constitutional convention, by periodic examinations of a mercury-barometer, no more should we attempt to investigate the laws of plant-distribution in Minnesota by adhering to the artificial lines which separate it from adjacent commonwealths or divide it into counties, towns or sections.

The Minnesota valley as a natural area. When one endeavors to divide the state of Minnesota into natural regions for the purpose of prosecuting a botanical survey, the river-valleys at once present themselves as suitable areas. As is well-known Minnesota lies squarely at the crest of the North American continent. Its altitude above the sea is less than that of other places which might be named; but notwithstanding this it is within its borders that the three great river systems of the continent find their head-waters. Flowing northward is the Red river, the principal tributary to Hudson Bay; flowing eastward is the St. Lawrence, the principal tributary to the Atlantic, and flowing southward is the Mississippi, the great

central river of North America, emptying its waters into the Gulf of Mexico. There may be distinguished then, these three drainage-basins, and each might be a suitable district for study along the lines contemplated in the establishment of a botanical survey. It happens however that the Mississippi drainage-area in Minnesota admits of a natural subdivision. The Minnesota river which joins the larger, but geologically newer stream, at Ft. Snelling, is in many ways the most interesting portion of the Mississippi basin. As will be shown later, in the special chapter devoted to this valley, the Minnesota is peculiarly central in its location and remarkably interesting, not only from its topography and situation, but on account of its history as well.

Occupying the position that it does the Minnesota valley, while a subsidiary drainage-basin, becomes one of first importance in Minnesota. It is, therefore, the natural region which has been chosen for study at this time. Later, it is hoped, the other basins to which the superficial area of Minnesota may be referred, will receive attention. Thus a final report of the botanical survey will knit together the data acquired through the consecutive investigation of the different natural districts making up the state. For the purpose of the botanical division of the Geological and Natural History Survey, then, the state of Minnesota may be considered as presenting these divisions: (3½).

| | | |
|-------|--|---------------|
| I. | Rainy Lake river drainage-basin..... | 11,347 sq. m. |
| II. | Red river drainage-basin..... | 18,106 sq. m. |
| III. | Lake Superior drainage-basin..... | 7,689 sq. m. |
| IV. | Minnesota river drainage-basin..... | 15,706 sq. m. |
| V. | Rock river drainage-basin..... | 1,929 sq. m. |
| VI. | Des Moines river drainage-basin..... | 1,639 sq. m. |
| VII. | Cedar River drainage-basin..... | 1,206 sq. m. |
| VIII. | St. Croix river drainage-basin..... | 3,669 sq. m. |
| IX. | Other tributaries of Miss. below St. Paul..... | 6,399 sq. m. |
| X. | Central Mississippi drainage-basin..... | 16,596 sq. m. |

Total area of Minnesota.....84,286 sq. m.

Only the 4th and 10th of these basins are peculiarly Minnesotan (disregarding the unclassified IX. div.). Of these two the Minnesota is much the older and more interesting area, as will be discussed later.

History of botanical investigation in the Minnesota valley. In the earlier published works relating to the plants of Minnesota it is not possible to determine accurately what references

(3½). **Hall:** *Physiographic Conditions of Minnesota*. Proc. Hort. Soc. 393 (1884).

belong to the valley of the Minnesota. Since no bibliography has yet been published of the district in question or of the state in general—except the preliminary one compiled with much care by Mr. Warren Upham (4)—it seems advisable to introduce at this point such a list as shall cover at least the more prominent papers, memoirs and volumes known to the writer.

Bibliographical List of Publications Relating to the Plants of Minnesota.

In this preliminary and partial list the * is prefixed to such titles as convey information concerning the valley of the Minnesota.

Jesuit Relations (1626-1679).

Occasional references to food or fuel plants.

La Salle: Margry's Decouv. et Etabl. de France, Am. Sept. (1683).

Le Suer: Pennecaut's Narr. (1705).

Carver: Trav. N. Amer. (1779).

Observations of Sugar-maple, Vines, Oaks, Pirus, Prunus, Angelica, Apios or Astragalus, Humulus and a number of others, not all of which, perhaps, are to be credited to Minnesota.

**Pike*: Exp. Miss. and La. during 1805-6 and-7 (1810).

Observations of Pinus strobus, P. resinosa, Tilia, Ulmus, Fraxinus, Quercus, Acer, Populus, Abies, Larix, Zizania, Thuja and a few others.

Torrey: List of Pl. coll. by Capt. D. B. Douglas at the sources of the Mississippi. Sill. Journ., ser. I, vol. IV, pp. 56-69 (1822).

**Nuttall and Schweinitz*: Say's Pl. from Long's Exp., Appx. in Keating Narr., vol. II (1825).

124 species of ferns and spermaphyta, 30 definitely attributed to Minn.

**Beltrami*: Decouv. Sourc. Miss. et Sanglante (1824).

Observations of Maples and Oaks.

**Schoolcraft*: Narr. Exp. Itasca, pp. 160-165, plants coll. by Dougl. Houghton (1834).

247 sp., 115 attributed to Minn.

**Torrey*: Geyer's coll., Nicollet Rep. (1843).

Catalogue of 446 sp., 60-65 from Minn., most of the others from Dakota.

Eaton and Wright: Man. Bot. N. Amer., ed. VIII (1841).

Some vague references to Minnesota localities.

Gray: Man. Bot. N. U. S., ed. I (1848) and succeeding editions.

In the first edition vague references to Minnesota localities.

**Featherstonehaugh*: Canoe-Voy. Minn. Sotar (1847).

A few notes of common trees, shrubs and herbs.

**Pope*: Rep. Pemb. Exp., ex. Doc. 42, 31st Cong., Sess. I. (1851).

Notes of common trees and shrubs.

**Parry*: Syst. Cat. Pl. Minn. and Wisc., Owen's Rep., pp. 606-622 (1852).

**Clark*: Hanchett and Clark, Rep. Geol. Surv. (1864).

Enumeration of 65-70 native plants and 30 cultivated varieties.

(4). *Upham*: Cat. Fl. Minn. XI. Rep. Geol. Nat. Hist. Surv. Minn., (1833).

- ***Lapham**: Cat. Pl. Minn., Rep. Minn. Hort. Soc. (1875).
951 species noted as growing in Minn.
- ***Twining, Winchell, Harrington, Sperry, Juni, Roberts, Garrison**: In vols. I-IX, Ann. Reps. Geol. and Nat. Hist. Survey, N. H. Winchell, State Geologist (1872-1880).
Dawson: Bound. Rep., pp. 351-379 (1875).
289 sp. Phanerogams from Canadian line.
- Chickering**: Pl. Coues, Red river coll., U. S. Bound. Comm. (1878).
96 species from boundary region near Pembina.
- ***Catheart**: Ferns of Minn., Bull. Minn. Acad. Sci. I., 303-304 (1877).
30 species and 3 varieties.
- Manning**: Wild Flowers of Lake Pepin valley, Rep. Minn. Hort. Soc., pp. 83-116 (1884).
Catalogue of 504 species.
- ***Upham**: Catalogue of the Flora of Minnesota; Geol. and Nat. Hist. Survey, Rep. XI (1883); reprinted (1884).
1650 species of flowering plants and Pteridophyta. This very valuable work is a complete compilation from preceding papers and contains much additional information.
- Arthur**: Rep. Botan. Work in Minn. for 1886, Bull. 3, Geol. and Nat. Hist. Survey of Minn. (1887).
Includes work by Holway, Bailey, Upham and others. 750 sp. listed from N. Minnesota. Camp located in 48° N. lat., near Lake Vermilion. This list is important, not only as a contribution to our knowledge, but because it is the only list yet published based entirely on herbarium material which is preserved by the state.
- ***Upham**: Suppl. Minn. Flora, Bull. 3, Geol. Nat. Hist. Surv. (1887).
- ***Britton and others**: Torrey Bulletin—papers on generic revision often contain notes on Minn. forms. (1884—).
- ***Botanical Gazette papers**: Many notes and references to Minnesota plants are scattered through this publication. (1885—).
- ***MacMillan**: E. extension of *Pentstemon albidus*, Torr. Bull., Oct. (1890).
Id. Note on a Minn. species of *Isaria* and an attendant *Pachybasium*, Journ. of Mycology, vol. VI, No. 2 (1890).
Id. Note on a new species of *Actinocephs*, B. and Br., Am. Naturalist, Aug. (1890).
Id. Notes on some Phanerogams of Central Minnesota, Bot. Gazette, Dec. (1890).
Id. *Salvinia natans* in Minnesota, Torr. Bull., Jan. (1891).
Id. Some notes on parasitic fungi affecting the leaves of *Sarracena purpurea* in Minnesota, Torr. Bull., July (1891).
- ***Id.** Les Plantes Européennes introduites dans la vallée du Minnesota, Rev. Gen. de Botan. No. 34 (1891).
E. J. Hill: *Pinus Banksiana* in the West, Torr. Bull., Mar. (1890).
Id. *Zizania* as found by the explorers of the N. W., Torr. Bull., Feb. (1891).
Id. Flora of St. Croix region, Bot. Gazette, May (1891).
Id. Flora of the Lake Superior region, Bot. Gazette, June (1890), and fol.
- ***Leiberg**: Fl. Dak. and Mont., Rep. Minn. Hort. Soc., pp. 361-367 (1884).
- Trelease**: Revision of *Epilobium* (1891).
References to Minnesota material.

- Id.** Revision of *Rumex* (1892).
References to Minnesota material.
- Wheelock:** Genus *Polygala* in N. America, Torr. Mem. II, No. 4 (1891).
References to Minnesota material.
- Bailey:** Study of the Genus *Carex* (1887).
References to Minnesota material.
- Bailey:** Types of the Genus *Carex* (1889).
References to Minnesota material.
- *Sargent:** N. Amer. Silva, vols. I, II, III,—(1890—).
References to Minnesota plants.
- Johnson:** Mycological Flora of Minn., Bull. Minn. Acad. Sci. (1877, 1878, 1879).
775 species of fungi, many doubtfully identified.
- *Arthur:** Some Algae of Minn. supposed to Poison, Bull. Minn. Acad. Sci. Appx. (1883).
- Johnson:** Mycological Flora in VI. Rep., Geol. and Nat. Hist. Survey (1876).
558 species listed; many doubtful.
- Gray:** Revisional papers in Proc. Am. Acad., (1883-1888).
- Watson:** Revisional papers in Proc. Am. Acad., (1885-1891).
- Britton:** Revisional papers in Trans. N. Y. Acad., (1887—).
In all of these occasional references to Minnesota material are to be looked for.
- Macoun:** Flora of Canada, (1883—).
References to northern border localities.
- Upham:** Geographic Limits of species of Plants in the Basin of the Red river of the North, Bost. Nat. Hist. Soc. Proc. (1891).
- *Gray:** Synoptical Flora (1886).
Many references to Minnesota.
- Reports** of Minn. Hort. Soc., Forestry Comm., Agric. Soc. and Experiment Station. (1870—).
- Wolle:** Algae of Minneapolis, Bull. Torr. Club., X, 13-21 (1883).
Enumeration of species new to U. S., collected near Minneapolis by Miss Eloise Butler. 18 sp., 8 forms new to science.
- Wolle:** Desmids of U. S. (1884).
References to Minnesota localities.
- Id.** Fresh-water Algae of U. S. (1887).
References to Minnesota localities.
- Journal of Mycology,** (1885—).
Occasional scattered allusions to Minnesota localities and fungi.
- Houghton:** Loc. Plants coll. in N. W., Exp. (1834).
- *Riddell:** Syn. Fl. W. States (1835).
References to Minnesota localities.
- Lapham:** Grasses of Wisc. and adjacent States, Trans. Wisc. Agric. Soc., III, 397-488 (1853).
- Whitney:** Flora of Lake Superior Region; Foster and Whitney's Rep. Geol. Lake Sup. Land Dist., II, 359-381 (1851).
- Pammel:** Weeds of S. E. Wisc. and Minn. (1887).
- *Leonard:** Filical Fl. Minn., Bull. Minn. Acad. Sci. (1877-78).

Doubtless other titles could be added, but the above will indicate most of the geographical work that has been accomplished upon the plants of Minnesota. A large number of local collectors are and have been residing in Minnesota, and to the energy of these is due our information, at present accessible, concerning the plants of Minnesota. To give a list of these would be difficult since they are scattered throughout every county. Many have but meagre collections, while some have worked long and patiently over the state flora and possess good representative collections from all parts of its domain.

Unfortunately, the only excellently complete list of Minnesota flowering-plants and ferns is not largely based upon an existing herbarium. In the herbarium of the Geological and Natural History Survey, when it came under the charge of the present State Botanist, there were only 621 species of our vascular flora out of about 1,700 known, represented by specimens. Since that time many of the gaps have been filled, while many remain. The Arthur list of 1887 is fortunately based upon a skilfully prepared and carefully preserved herbarium and this is on file in the cases of the Survey. Other accessions to the state-flora, as represented in the herbaria preserved at the University have come from time to time through exchange, presentation and personal collection. The principal and most important contributions to the state-cabinets have been made under the present working plan. In June, 1891, Messrs. E. P. Sheldon, C. A. Ballard and B. C. Taylor were commissioned to prosecute field-work in different portions of the Minnesota valley. Mr. Ballard spent two months in the vicinity of the mouth of the Minnesota, working through Carver, Scott and Dakota counties. Messrs. Sheldon and Taylor spent three months in the southern and western portions of the valley. Pope and Douglas counties were specially studied by Mr. Taylor, and the valleys of the Cottonwood, Redwood and Lac Que Parle by Mr. Sheldon, who also spent some time along the northeast slope of the Coteau des Prairies, especially in the vicinity of Lake Benton. Through the intelligent, energetic and expert endeavors of these, some 20,000 specimens of flowering-plants, vascular cryptogams, mosses, fungi and fresh-water algae were collected, of which number more than 3,000 have been mounted in proper fashion and placed in the herbarium of the survey. The total number includes many exchange plants and duplicates which will be of value in building up weak places in the general herbarium.

Care and identification of material. The identification, distribution and arrangement of all the phanerogamic and vascular material collected during the season of 1891 was put in charge of Mr. E. P. Sheldon, whose ability and aptness for the work have been an indispensable assistance to the author. Under the direction of Mr. Sheldon, Mr. W. D. Frost and Mr. A. P. Anderson gave some time to the mounting and arrangement of such plants as were reserved for the general herbarium. This work occupied the entire autumn of 1891 and the winter and part of the spring of 1892. The large collections in the herbarium of the Department of Botany, which numbers not far from 62,000 specimens, afforded excellent facilities for comparison when critical forms were under consideration. A few doubtful forms have been submitted to specialists, but in no cases have the determinations of Mr. Sheldon been modified.

Citation of herbarium specimens. Every plant in the herbarium of the survey is known by its collector's name followed by a serial number. It thus becomes possible to refer to any plant definitely and decisively. Any mistakes in identification, if such should by chance occur, would thus be easily discovered and corrected by future workers. Under each species in the subsequent list of Metaspermae occurring native in the Minnesota valley, all the herbarium material at hand is entered. Not only is the Minnesota valley material properly inserted, but all Minnesota specimens receive their place under the appropriate heads. Only such Minnesota specimens as belong to species not known or believed to occur in the drainage basin of the Minnesota river are excluded. In this way a complete account of the status of each species, in the herbarium, is presented to students throughout the state, and gaps or poorly represented species may receive attention from future collectors.

In addition to the citation of all Minnesota specimens of Minnesota plants, so far as represented in the herbariums of the University, citations have been made from the personal collections of Mr. Sheldon, Mr. Wickersheim, of Idlewild, Lincoln county, and Judge Moyer, of Montevideo, gentlemen who have kindly contributed by the loan of their herbaria to our knowledge of the limits of species in their districts. The collection of Mr. Sheldon, cited as *Herb. Sheld.*, is principally from the Ft. Snelling district; that of Judge Moyer, cited as *Herb. Moyer*, from the mouth of the Chippewa river; that of Mr. Wickersheim, cited as *Herb. Wickersheim*, from Lincoln

county and Mankato. With the addition of these, the total number of locality-citations is not far from 6,000.

Determination of ranges outside of Minnesota. Curiously enough there is no work accessible to students of the Minnesota flora in which the complete range of Minnesota plants is given. This can readily be excused in the case of fungal or algal lists, for the ranges of many of these lower forms are very insufficiently known and could scarcely be compiled without great labor and uncertainty. In the case of the higher seed-plants, the Metaspermae, there is less difficulty in obtaining the intra- and extra-continental distribution, but in manuals, floras and lists published in America it is common for the range, outside of the area arbitrarily chosen, to meet with little or no consideration. This is proper if the list is intended only as an enumeration, but if it is meant to be serviceable to students in any other way, it would seem scarcely out of place to indicate in it the complete range of each species noted. In no other way can the plants of a region be presented logically to the student. This is especially true when the lists are based upon unnatural districts of observation. In any case it seems useful to know the general range. With this in view, the writer has been at considerable pains to compile from the original sources, as far as possible, the American and Old-World distribution of all plants which are considered as native to the Minnesota valley—that is, all plants introduced within its borders by agencies other than the activities of man. Citations of page and number are given of all authorities thus consulted. The principal local floras of America have been indexed and certain lists of the Old World, comprising some from both Atlantic and Pacific regions, have been included in this tabulation. Under each specific name citations of literature upon which geographical range is based may be found, and reference to such cited works will be sufficient in most cases to fill out the detail of distribution which is suppressed for want of space.

Citation of generic and family ranges. The genera and families are handled in much the same way as the separate species and varieties. Under each generic name is cited the principal synonymy, excluding most pre-Linnean names, and following this a few standard compendia of genera or generic indices. It is thus possible for the student to refer at will to the detailed descriptions of genera found in the cited works, or very readily to come into a knowledge of the literature concerning any genus of his inquiry. The number of species referred to a

given genus in different portions of its range is indicated and the general generic range is briefly given. This compilation permits the student to see at once in which portion of its general range any given genus is preponderantly developed, and to compare the relative development of allied or distant groups.

Citation of authors of genera and species. In order to obtain stability of nomenclature it is necessary to provide that the name of a plant, *the specific name*, can not be changed through caprice or whim. Nor can it be changed through ignorance, providing the mistake through which the change was made has been discovered. The refusal to correct mistakes and the disinclination to do thorough bibliographical work before publishing a new specific name is the cause of most confusion in botanical nomenclature. Hence has arisen the so-called international law or law of priority which provides that the earliest published specific name of any plant must stand providing that name is not antedated by some other similar name applied to a plant belonging in the same genus. Many botanists do not admit the validity of this principle except in the case of species which they may have themselves named and published. With reference to others they are accustomed to insist that "custom," "long-established-habit" and a conservative condition must be maintained. This is to save the difficulty of having to revise their own systems of nomenclature, and serves in many cases to cover inaccuracies or hastiness. With this conservative position, the unthinking and unbotanical are always distinctly satisfied and are accustomed to declare that botanical nomenclature is purely a "practical matter" and should be taken out of the hands of the botanists altogether and turned over to some unprofessional commission for settlement (5). Objections of this sort are natural, for the changing of names in our accustomed department of science is always a confusing matter. Such criticism is, however, unthinking and unbotanical because it fails to recognise that the whole difficulty has originated on account of just such conditions as are extolled and recommended for perpetuation. The only way to obtain a stable nomenclature is by rigidly enforcing the law of priority with reference to specific names. All instability finds its well spring in the disregard of this law, and stability under our present general system of nomenclature can only be obtained by strict adherence to the oldest available specific name, by whomever or wherever it may have been published.

(5) **Rand:** *Bot. Gazette*, XVI. 318-319 (1891).

The cause of the present upheaval in plant nomenclature, signalled, but not at all initiated, by such a book as that of Kuntze (6), is very easy to discover. Never so much as to-day has botany become world-wide. The multiplicity of periodicals, the facilities for exchange and correspondence between different countries, expeditions, congresses, communications, the development of new centers of activity in all parts of the globe, all conspire to make insularity of nomenclature impracticable, except for those who do not care to be within the pale of the modern conditions. It was a matter of less importance fifty years ago, if the name *Potamogeton pauciflorus* was given to one plant in France, by Lamarck, and to quite a different plant in America, by Pursh. There was less danger of confusion, for French botanists and American botanists were not then so distinctly interested in each other's field. The international character of science was recognised long ago in the adoption of an international language—Latin—in which oriental and occidental investigators can communicate, whatever their native dialect. The law of priority simply carries this recognition farther, and provides that in the department of nomenclature Latin shall be used in the same sense in all countries.

In America the rightful implication of the law of priority has been ably expounded by Britton (7) and Greene (8), seconded by many others. Under their leadership most of the younger school of botanists have determined to enlist, but the older men whose life-works have been largely accomplished under the older and insular interpretation, the *provincial dispensation*, as it may be named, have in most cases failed to withdraw from the position of their youth—the “position of naming-plants-as-one-pleases”—and their publications are in consequence marred by the illegal nomenclature. Manuals and handy-reference-floras, most local lists and many monographs have perpetuated the faulty and insular methods and it is but very recently that a concerted attempt is being made to establish this department of botanical work upon the only sure foundation possible without a complete withdrawal from the existent system.

The present list, therefore, contains many unfamiliar names, but with these are cited, so far as possible, other post-Linnean

(6) Kuntze: *Revisio Generum Plantarum* (1891).

(7) Britton: *Papers in Bull. Torrey Bot. Club and Ann. of N. Y. Acad; Contr. Columbia College Herb.* (1885——).

(8) Greene: *Pittonia. Flora Franciscana*, etc. (1885——).

names; so that the reader who prefers to maintain the current, though not-to-be-recommended attitude, will "have no difficulty in choosing a name to suit his taste, or, if he desires, he may establish a name of his own." Preference has always been given, by the writer, to the oldest unpreempted specific name and the date of publishing has been determined in every case with as much accuracy as possible. For all names printed, the author, page-number of work and date of publication have been cited and an effort has been made to procure exact bibliographic detail so far as conditions would permit. Bibliographic works, such as those of Pritzel (9) and Jackson (10), have been of much assistance in determining publication dates of many obscure and inaccessible works while the libraries of the Department of Botany and the Survey, at Minneapolis have been serviceable. In addition, the full collection of books belonging to the University of Nebraska, and the personal library of Dr. Chas. E. Bessey were put at my disposal, and through this courtesy many references that could not otherwise have been verified were critically examined. Furthermore, under the direction of Dr. N. L. Britton and Dr. Thos. Morong, bibliographic work on some 250 references which had proved puzzling was conducted for me in the libraries of Columbia college and in New York. By this kindness many gaps have been filled. The Linnaean citations have been worked out with the aid of Richter's well-known work (11) and revisional assistance has been derived from the notes in Hitchcock's Ames Flora (12) and the chapters in Kuntze (13). Besides these a large number of minor aids have been received from numerous sources. I believe full credit is given under each head in the general list, for all sources of information drawn upon.

Synonymy and orthography. It is not pretended that a complete synonymy is given in any case, although it has been the endeavor to make it as complete as possible. In the old division *Polypetalae*, use has been made of the remarkably exact and painstaking bibliographic index prepared by the lamented Sereno Watson (14); in the *Gamopetalae* the laborious compilations found in Gray's Synoptical Flora (15) have been, in most

(9) **Pritzel:** *Thes. Bot. Lit.* ed. I. (1851.)

(10) **Jackson:** *Guide Lit. Bot.* (1881.)

(11). **Richter:** *Codex Linnaeus* (1835).

(12). **Hitchcock:** *Fl. Ames*, Trans. St. Louis Acad. Sci. (1891).

(13). **Kuntze.** *Revisio Generum Plantarum*, Vol. I, introd. CXXII—CXLVI. (1891).

(14). **Watson:** *Bibliographic Ind. N. Amer. Bot.* Pt. I (1878).

(15) **Gray:** *Syn. Fl. U. S.* (1886).

cases, considered final, while in the *Apetalae*, so-called, and the monocotyledons the works of Torrey (16), De Candolle (17), Richter (18) and many others have been of prime assistance. In addition to these, a number of other works have been useful, especially in the lower families, where, for an evident reason, the least compilatory labor has been expended by previous workers. In particular cases help has been extended by specialists, *e. g.*, by Morong in *Potamogetonaceae*, Lamson-Scribner in *Gramineae*, Britton in *Cruciferae*, Coulter in *Umbelliferae*, etc. This is all gratefully acknowledged.

The synonymy is in general chronologically arranged and the specific name chosen is in every case so far as the writer knows, the one sanctioned by priority regardless of variance with "custom" or "authority." As explained above this is at once the most modern and, it would appear, the most logically correct rule to follow. One point which should merit attention, perhaps, is the uniformity with which capital letters are suppressed from specific names, even in the synonymy. It is probable that the writer is fairly open to criticism for suppressing such capitals in a synonym, while he might not merit it for the suppression in the particular name he himself is inclined to sanction. Nevertheless no capitals will be found in specific names whether they are derived from proper nouns or not. This is a practice in line with custom, as may be discovered by referring to the older American manuals, and is conducive to regularity and system. The particular practices of different authors in regard to this trivial point may be learned by reference to their pages. Again, ancient spelling has generally been retained in the specific names, even if at variance with a more recent rule. Thus the law of priority is guarded most safely, and personal preferences, are, so far as possible, excluded.

It must be noted, however, that the law of priority in plant nomenclature does not contemplate, as generally interpreted, any pre Linnaean work as of importance. An arbitrary starting point must be determined for botanical names just as an arbitrary point of latitude or longitude is determined. As there is no natural longitude to be discovered, so there is no natural demarcation-line between the older methods of nomenclature and the newer. Hence confusion arises: some writers cite

(16). **Torrey:** *Fl. N. Y.* (1843); **Torrey and Gray,** *Fl. N. Am.* (1838-41).

(17). **De Candolle:** *Prodromus*, (1824——).

(18). **Richter:** *Plantae Europeae*, Pt. I, (1891).

generic authors back to Tournefort, others are inclined to go back to Dioscorides or Pliny (19) with their references. There is ample room for argument in this department of the subject, but apparently no room for dogmatism. It will be generally acknowledged that any starting point is, of necessity, arbitrary, and it becomes a matter of preference, to be determined as far as possible in the light of convenience and custom whether one base-line or another be adopted.

The common notion of lay-botanists that Linnaeus was the founder of genera or the inventor of the binomial system of nomenclature, is of course, readily corrected by the facts of history. Nevertheless, Linnaeus is generally admitted to have been the first to reduce nomenclature, specific and generic, to an orderly condition. His work is therefore, for convenience, adopted as a meridian and in these pages specific citations do not go back of the 1st ed. of the *Species Plantarum* (20), nor generic citations (except in the case of some synonyms) back of the 1st ed. of the *Genera Plantarum* (21). I am unable to see any gain in citing from the *Systema* of 1735.

Citation of genera and families. It seems clear for apparent reasons that priority should govern in generic names, for in the present condition of botanical science the conception of a genus is relatively stable. This is true whether one adopts a wide or narrow notion of a given genus. Family and ordinal names, are, however, not yet likely to be stable, for they are based upon a more fluctuating foundation. It is probable that the time is not yet ripe for a definite and sharp determination of family or ordinal characters. While, then, priority may rightly govern in generic citation, there is no reason to insist upon it in family, ordinal or class citations. But if this should be gainsaid, the position may at least be maintained that the meridian here adopted should be the *Genera* of Endlicher (22). It would appear that any purely intellectual concept like a family of plants, which certainly has no objective existence, but is merely a category in which we are accustomed to group certain quite distinct individual organisms on the basis of supposed relationship, abstracted from observed and hypothesised resemblances, should be elastic in name as it is elastic in significance. The evident objection is that this is true also of genera and species, which are, in like fashion, subjective cate-

(19). S. F. Gray: *Arr. Brit. Pl.* (1821).

(20). Linnaeus: *Species Plantarum*, ed. I. (1753).

(21). Linnaeus: *Genera Plantarum*, ed. I. (1737).

(22). Endlicher: *Genera Plantarum* (1836-40).

gories rather than objective realities. Admitting the unquestioned truth of such an objection, it seems nevertheless that the species and genera stand out somewhat less nebulously than the families, classes or divisions. Their boundaries have been more accurately mapped, their highways and by-ways have been more carefully charted and it is more admissible to demand for them at least the semblance of a stable nomenclature. In consequence of such considerations as these it has seemed unwise to insist upon strict priority in the names of families while maintaining it for the names of genera. This position is, however, not unlikely to be erroneous, or at least inconsistent.

For reasons outlined above the genera have been determined under the law of priority, but this has not been insisted upon for the families. Under both families and genera, page numbers of dated works are indexed, and such works have been selected as should at once put the student who refers to them in a fair way to gain a knowledge of the literature of any plant which might command his attention. The standard modern works have alone been cited, except in certain cases of peculiar historical or local interest, for, from these, proper references to older works may be compiled.

Generic synonymy and limitation. Since there is little uniformity in the limitation of genera, it is customary in works like the one in hand to follow some recognised authority, selecting the authority either at random or under the influence of local conditions. Bentham and Hooker's monumental work (23) has during the last twenty years served as an authority to the English-speaking races and in less degree to others. In general the lines of generic limitation established in this great work have been adopted by the writer. In particular cases, however, the lines of Baillon (24) and of the monographs collected in Engler and Prantl's not yet completed work (25) have been followed, thus emending the limits as proposed in the older volumes.

Synonymy has been quoted to indicate the precise limitations accepted and all this synonymy has been properly referred to its original authors, and the places and dates of publication have been compiled. The list serves, therefore, as a partial date-index to Bentham and Hooker, Baillon and the German monographers. Genera proposed prior to the 1st ed. of

(23). **Bentham and Hooker:** *Genera Plantarum* (1862-1883).

(24). **Baillon:** *Histoire des Plantes* (1867-1881—).

(25). **Engler and Prantl** *Natuerl. Pflanzenfamilien* (1887-1893—).

Linnaeus' *Genera Plantarum* unless adopted by him have been regarded as devoid of prior right to consideration. In the Linnaean works, page-numbers and page-positions have been held to establish priority and older generic names have always been maintained over newer. When genera have been combined the older names are always retained for the new combinations, except in such cases as *Stachys-Betonica* or *Sorbus-Pirus* where the newer name received the greater number of species in 1753. This is the rule proposed by Kuntze and it is reasonable.

In general the nomenclature adopted is believed to be thoroughly abreast of the times. To compile this has been a much more difficult task than it would have been to accept unquestioningly the names as presented in such a book as the Watson and Coulter revision of Gray's Manual (26). It is believed, however, that in a list like this the eye should be cast forward instead of backward, that the future should receive consideration as well as the past. To the complaint, which has much of reason in it, that all changes in nomenclature should be left to monographers and should be carefully avoided by the compilers of local floras, only one thing can be said. That is this: there is no honesty in hiding behind some other's work simply because one's own work is of humble nature. In local floras as well as in monographs the public has a right to demand the result of the best and truest convictions of its servants. It is dishonest to put forward anything which one does not believe to be correct, on the plea that some one else will correct it. It is discreditable to conform to a custom that one does not sanction, that one believes is in rightful course of final extinction. With this and other exigencies held in view, the writer has not hesitated to uphold as strict an interpretation of the law of priority as may be possible. It has been a matter of concern, not so much to gratify a conservative instinct in those who may have occasion to use this list, as to keep squarely in the current of progress towards the better botanical nomenclature of the twentieth century. Reforms are not brought about by inaction or conformity. They must be contended for even at the risk of temporary disturbance of the established order.

The details of working which must demand attention on the part of the "nomenclaturist" when he considers so wide a field as the names of living or fossil organisms may offer him, have been indicated in many papers and volumes. Nomenclators,

(26). **Watson and Coulter:** *Gray's Man.*, 6 ed. (1890).

such as those of Pfeiffer (27), Steudel (28) and Kuntze (29) together with the laws of zoological and botanical congresses and papers by distinguished taxonomists, such as Agassiz and A. Gray have been freely consulted and the basis of nomenclature in the case of the Metaspermae has been derived from such critical, historical and bibliographic labors. Those who are interested in the detail may find abundant discussion in these cited works, which, together with the controversial and argumentative material published from time to time by the Royal Botanical Gardens at Kew, the Continental and Australasian Gardens and the various botanical periodicals and ephemera that concern themselves with such subjects, will be found to present the questions outlined above, from a wide variety of view-points. With Kuntze, it may well be said that while nomenclature itself is hardly to be named a science, it is certainly an important adjunct of science and as such demands thoughtful attention.

Arrangement of families and genera. The arrangement of families and genera follows as exactly as possible the lines laid down in Engler and Prantl's *Natuerlichen Pflanzenfamilien*, which is beyond compare the most important taxonomic summary yet published for the plant-kingdom. This arrangement is not particularly different from that which has come to be generally recognised within the last ten years. It is similar in general outline to that of Luerssen (30), Drude (31) and Warming (31½), and is a clear expression of modern views of the inter-relationship and evolution of the flowering-plants. Such an arrangement is preferable to the more ancient ones just in such degree as it is more accurate. The accuracy of the arrangement adopted is acknowledgedly incomplete, but it is believed to represent the full research of the times.

Natural divisions of the vegetable kingdom. The constant effort of the botanist is to make his classification of plants indicate not only resemblance but relationships. Indeed resemblances are considered of value in taxonomy only in so far as they indicate relationships. For this reason no classification is, or can be stable, since no classification is ever mature or complete. The ever-progressing knowledge of plant-anatomy, distribution, physiology and especially of embryology renders the

(27). **Pfeiffer:** *Nomenclator Botanicus* (1874).

(28). **Steudel:** *Nomenclator Botanicus*, ed. II. (1840-41.)

(29). **Kuntze:** *Rev. Gen.* (1891.)

(30). **Luerssen:** *Systematischen Botan.* (1878-1883).

(31). **Drude:** *Syst. und Geogr. Anordn. Phan.* (1890).

(31½). **Warming:** *Syst. Botan.*, Germ. Tran. (1890).

grouping of yesterday unscientific and archaic to-day. Popular manuals, wherever they may be published, however painstakingly and skilfully they may be compiled, are always distinctly in the rear of actual botanical advancement in that group which they propose to elucidate. The well-known and reasonable demand for stability in nomenclature is sometimes accompanied by an unreasonable demand for permanence of classification, but if such a demand could be granted it would indicate absolute stagnation in botanical or zoological science, such as can not, under present intellectual conditions of the race, readily be conceived. While, therefore, the constant shifting from one classification to another is exasperating to the conservative student, it is nevertheless a necessary result of advancing information, and to refuse to consider the new systems which may be put forth in scientific fashion is as unreasonable as it was in those days when the railway carriages were first brought into use for one to insist upon travelling by the old stage-lines of an earlier mechanical era.

The vegetable kingdom becomes more and more difficult to arrange in well ordered groups as one's knowledge of its complexities and relationships increases. The old notion, for example, that it is possible to divide plants into those with flowers and those without, by an arbitrary demarcation-line, has gradually disappeared as more and more information has been collecting regarding the life-histories and homologies of such transition types as *Selaginella*, *Isoetes*, *Cycas*, *Casuarina* or *Marsilia*. The two divisions seen so clearly by Linnaeus have come to merge into each other and must be defined to-day in far different terms than in 1735. And again the old divisions of the Dicotyledones—Polypetalae, Apetalae and Gamopetalae—have been found to be untenable, for they serve to separate into different groups, genera which from a preponderance of characters are generally believed to be closely related. Under the stress of renewed examinations the Polypetalae and Apetalae have been combined and in this work the combination-name applied is *Archichlamydeae*. These serve as examples of changes in nomenclature resulting from changes in view-points under increased knowledge.

It will be appropriate to give, in this introduction, a word or two to the later methods of plant-classification. Mention may be made, very briefly, of the basis of such classification. In the first place, a survey of the vegetable kingdom reveals that all the forms known to us may be thrown into two groups

based upon the presence or absence of sexuality. We have, therefore, the two great divisions:

A. PROTOPHYTA: Plants in which sexuality has not been developed and in the ancestral line of which it is believed, from collateral evidence, that there are no sexually complete progenitors.

B. METAPHYTA: Plants which manifest sexuality or indicate by accessory characters that in their ancestral lines there have occurred sexually complete progenitors.

These two great divisions are not clearly delimited, owing to the presence of transition-forms which unite the lower group with the higher. Such a form is the well known *Ulothrix zonata* in which certain cells function indifferently as spores or gametes (marrying cells). Furthermore, the limits are obscured by such reduced forms of the Metaphyta, as undergoing retrograde metamorphosis, have lost their sexual characters and often resemble closely the upward-tending types of the Protophyta, which are acquiring sexual characters, or on the point of acquiring them, one might say. Such intermediate forms, whether rudimentary or reduced, render exact limitation of the two great divisions quite impracticable.

In similar fashion it is possible to arrange the Metaphyta in two subdivisions based upon the development of the fertilised egg. In the lower forms, after fertilisation, the egg proceeds to develop a plant like the parent, which produced the egg; in the higher forms, the egg undergoes a preliminary subdivision, the result of which is the ultimate development of few or very many cells, *each of which* is normally capable of producing a plant like one of the parents. We therefore have the two following subdivisions:

I. GAMOPHYTA: Metaphyta which normally develop sexual plants from their fertilised eggs without the interpolation of any spore-producing structure.

II. SPOROPHYTA: Metaphyta which normally subdivide the fertilised egg into a cellular structure, capable of growth, all or part of which consists, when mature, of spores, from which sexual plants are normally produced. Such a cellular structure is called a *sporophyte* or sporophytic plant.

Examples of I. are the lower *Zygophyta* and *Oöphyta* of Bessey (32), plants like the pond-scum (*Zygnema*) or the black-mould (*Rhizopus*, *Mucor*): examples of II. are too numerous to mention, for in this subdivision are all plants inclusive of, and higher

(32) **Bessey:** *Text Book of Botany*, 6 ed. (1889).

than such algae as *Oedogonium*. A discussion of the conditions under which the Sporophyta probably originated and notes on their classification may be found in recent periodical literature (33, 34, 35, 36). It may be well to say that all of our subject-matter, in the following list is purely sporophytic.

Continuing our classification of the vegetable kingdom, it will be found that we may again divide the Sporophyta into three alliances based upon the manner of development of the egg-organ or archegonium. This organ combines the functions of an ovary and uterus as commonly recognised in the mammalia. That is, it produces the egg, during the differentiation and maturation of its cellular structure, and it retains the egg as within a pouch, nourishing it through at least its first segmentations after fertilisation in view of which the egg develops as an embryo sporophyte. We may distinguish, then, the three following alliances of the Sporophyta:

(1). **THALLOPHYTA:** Sporophyta in which the egg-organ is not developed as a protective structure about the egg and in which there are no accessory characters that indicate an ancestral line containing egg-organ-producing progenitors.

(2). **ARCHEGONIATAE:** Sporophyta in which the egg-organ is present and functional.

(3). **METASPERMAE:** Sporophyta in which the egg-organ is aborted and no purely vegetative cells are to be found in either the male or female plants.

Examples of the Thallophyta, which is here defined in the narrower sense and does not include the Gamophyta or Protophyta—as is more customary—are to be looked for among the sea-weeds, fresh-water algae and especially among the higher, spore-fruit-producing fungi, such as the mushrooms, puff-balls, etc.

Examples of the Archegoniatae are such algae as *Chara* and *Nitella*, the liverworts, mosses, ferns, pillworts, club-mosses, scouring-rushes. *Sigillarias*, *Lepidodendrons*, quillworts, cycads, pines and other conifers, and joint-firs. Transitional forms occur in the region of *Gnetum*, *Ephedra* and *Casuarina* leading over to the third and highest class of plants—the Metaspermae.

(33) **Bowers:** *Homologous and Antithetic Alternation*, Ann. of Bot. iv. 347-370 (1890).

(34) **MacMillan:** *Sexual Immobility as a Cause for the Development of the Sporophyte*, Amer. Nat. xxv. 22-25 (1891).

(35) **Campbell:** *Relationships of the Archegoniata*, Bot. Gaz. xvi. 323-333 (1891).

(36) **MacMillan:** *Suggestions on the Classification of the Metaphyta*, Bot. Gaz. xvii. 108-113 (1892).

Examples of the Metaspermae may be selected from the great mass of plants which contain their seeds in a closed "ovary," better named *carpellum*. Such plants range in structure from such lower forms as *Salix* and *Typha* to the highly developed *Orchidaceae*, *Umbelliferae* and *Compositae*, including such plants as *Listera*, *Myrrhis* and *Hieracium*.

A more definite characterisation of the Metaspermae may be added to the diagnostic limitation given above.

Characters of the Metaspermae. The Metaspermae, other wise called Angiospermae, are those Sporophyta which produce constantly polymorphic species-forms, consisting of always bisexual, vegetatively degenerate, parasitic gametophytic plants and always (a) bivalent sporophytic plants, one of which is produced from a close-fertilised egg and develops an *endosperm* of the seed, while the other is produced from a cross-fertilised egg and develops the *embryo* of the seed,—which latter, in turn, upon the germination of the seed, normally resumes development and matures into a structure of high vegetative specialisation from which are ultimately developed, either one or both sizes of spores, and from these the sexual plants are respectively produced. The smaller spores or pollen-grains are produced numerously in special spore-cases (*sporangia*), aggregated upon specially modified foliar or axillary structures called *stamens*. The larger spores are produced severally or, more commonly, singly, in a special sporangium (nucellus of ovule) surrounded with indusial membranes (ovular integuments) and the sorus (ovule) thus formed is borne in a closed foliar or axillary structure called a *pistil*. Of this closed pouch the actual seed-bearing cavity (ovary or *carpellum*) ripens into the fruit, which is always at first a closed structure. The seed is a ripened sorus commonly detachable from the structure upon which it was produced. It contains within the modified indusial walls (seed-coats) two sporophytic plants of different valency. One, produced from an egg fertilised by the sperm nucleus from the pollen-tube, is alone termed the embryo. The other, produced from a close-fertilised egg, is termed the endosperm, and is consumed by the embryo either during the ripening processes of the seed or during the germinating processes of the same.

It will be interesting to see how the Archispermae or lower seed-plants (*Gymnospermae*) differ from the Metaspermae. The fact that seeds are such distinct, easily defined bodies, in com

(a). Except in some *Orchidaceae*?

mon parlance, has induced many botanists to use them indiscriminately as always of equivalent morphological value. Late research shows, however, beyond reasonable question that the seed of the Gymnosperms so-called and that of the Angiosperms are totally different structures, morphologically and in point of development. The *Archispermae* is a name given to those Archegoniatae which produce structures similar to the seeds of the Metaspermae. As will be seen this "seed" is another thing entirely and merits a different name, but it will be known here as the Archispermous seed. To show its character it will be well to give a description of the Archispermae, to be placed side by side with the above characterisation of the Metaspermae.

Characters of the Archispermae. The Archispermae, otherwise called Gymnospermae, are those Archegoniatae which produce constantly polymorphic species-forms consisting of always bisexual, vegetatively degenerate, parasitic gametophytic plants, and an always univalent sporophytic plant, produced from a cross-fertilised egg and capable of maturing into a structure of high vegetative specialisation upon which are developed either one or both sizes of spores, from which the sexual plants are respectively produced. The smaller spores or pollen-grains are produced in special spore-cases (*sporangia*), aggregated upon specially modified foliar structures called *stamens*. The larger spores are produced singly in special sporangia (nucellus of ovule), surrounded with an indusial membrane (ovular integument) and the sorus (ovule) thus formed is borne upon a foliar or axillary structure which is not closed around the ovule. The seed is a ripened sorus containing the vegetative portion of a female gametophytic plant (the "endosperm") and one or more strictly homologous and analogous sporophytic plants, developed from eggs borne in the egg-organs of the female plants and cross-fertilised by nuclei transmitted through the hyphal, vegetative pollen-tube from the endosporous spermary of the male plant. During, or a little before, germination of the seed the female plant is consumed by the developing sporophyte which alone is capable of renewal of growth-activity.

It is seen by a comparison of these two characterisations that while the seeds of Archispermae and Metaspermae unite in the point of forming sporophytes capable of further development, upon germination, they are utterly unlike in the formation of

the nutritive tissues indifferently termed endosperm, in whichever way it is produced.

The production of "seeds" This is considered by the writer as of less taxonomic importance than the other points which have been mentioned, especially as the "seeds" are such different structures in the Archispermae and Metaspermae. However, the older botanists considered seeds as structures of great importance and in consequence the plants which produce seeds have been grouped together under the name of *Spermaphyta*. Linnaeus recognised this division, but gave it the name *Phanerogamia* under a mistaken notion that there was an analogy between two such widely diverse phenomena as pollenisation and fertilisation. The confusion brought about by this mistake has lasted until our own day. Later it was proposed to call these plants *Anthophyta*, or "plants which produce flowers." Those peculiar groupings of spore-bearing organs and accessory foliar structures which are termed flowers have, from their conspicuous character and high specialisation, always received particular attention and thus easily arose the early classification of vegetable organisms into flowering and flowerless plants—the *Phanerogamia* and *Cryptogamia* of Linnaeus. These divisions were based, however, not upon fundamental morphological characters but upon accessory, and have been pretty generally superseded by systems of classification which present a truer perspective by emphasising the more fundamental structural and developmental characters.

The classification of Engler and Prantl. In the *Natuerlichen Pflanzenfamilien* Engler and Prantl adopt a classification based upon characters of somewhat different value from those discussed above. They divide the vegetable kingdom into four branches:—I. *Mycetozoa*, slime-moulds; II. *Thallophyta* (in the widest sense); III. *Embryophyta zoidiogama* (plants producing ciliated spermatozoids and building up sporophytic embryos); IV. *Embryophyta siphonogama* (plants producing pollen-tubes and building up sporophytic embryos). It will be seen that in this grouping a much greater merging of characters is permitted than in the one outlined above. In the first place, by way of individual criticism, the writer is inclined to suggest that the *Mycetozoa* are more properly classed with the animals. The presence of a contractile vesicle alone, need not determine animal rank among those organisms that Haeckel terms *Protista*; but its presence coupled with the absence of chlorophyll is strong argument. *Volvox globator*, with its coenobial growth,

contractile vesicles and chlorophyll, may perhaps be safely set down as a plant. *Chondrioderma difforme*, with its plasmodial growth, its adelphotropic swarmspores, contractile vesicles and chlorophyllless nutrition, may be as safely set down as an animal. This point admits, however, of extended argument, which would here be out of place, and the impression must not be received that it is proposed to give it an off-hand settlement.

With reference to the Thallophyta of Engler it is apparent that this group is a catch-all. Forms widely distinct in phylogeny, physiology and structure are indiscriminately lumped together. Plants which have been limited above as Protophyta, Gamophyta and Thallophyta (in the narrower sense) are here tumbled into one broad and vague category. It is true that a single clue will perhaps never lead one out of the labyrinth, but in the face of the charge, that embryologists are rashly endeavoring to base their classifications upon single and possibly uncertain groups of facts, it is urged that the Thallophyta of Engler has neither coherency nor limitability. It serves to delimit the algae in a manner which throws into low relief the probable relationship between the algae and the higher plants. From *Coleochaete* to *Riccia* is not a long step, and it should not be made to appear that a taxonomic chasm separates these forms. Apart from insanities of homologising, such as those of Bonavia (37), there are actual contact points between the "sea-weeds" and the lower *Hepaticae* and a natural classification should recognise these contact-points. The Embryophyta of Engler (and to Engler alone may be ascribed this classification) are very nearly co-extensive with the Sporophyta as limited above. *Oedogonium* and allied forms are, however, omitted and, in our belief, this does violence to the natural arrangement. Provision should be made for the union of these related plants, for in the belief of the writer, next to sexuality, the development of sporophytes is the most fundamental fact of plant-comparative-physiology. Again the division of the Sporophyta need not be made upon those structural gametophytic characters employed by Engler when he divides his Embryophyta into two series, based upon the development of ciliated spermatozoids in the lower and the production of pollen-tubes in the upper. The researches of Belajeff alone (38) serve to indicate how slight is the actual difference

(37). **Bonavia:** *Phil. Notes on Botan. Subj.* (1892).

(38). **Belajeff:** *Zur Lehre von dem Pollenschlauche der Gymnospermen.* Bericht. Deutsch Botan. Gesellsch. IX. 274-286 (1891).

between such a condition as that of *Azolla caroliniana* among the *Zoidiogama* and *Taxus baccata* among the *Siphonogama*. Not only does it seem that the presence of pollen-tubes or of spermatozoids is a matter of secondary taxonomic importance, but it is perhaps hardly advisable to use a purely gametophytic character to limit off a group like the *Embryophyta siphonogama* which, to-day at least, comprises species described almost solely from sporophytic characters (*a*). While accepting the general arrangement of families as given in Engler's great work we cannot then, accept unquestioningly his broad groupings of the vegetable kingdom. However, it is possible that longer study will bring the classification of Engler into a more acceptable light. For the present it seems preferable to the writer to insist upon the basal importance of the *sporophytic* segmentations of plant ova and the subsidiary importance of spermatogametic and spermatogonial morphology.

There are a number of considerations in this general taxonomic summary which demand more complete examination, but enough has been said, it is hoped, to limit intelligibly though, to a certain extent, technically, the group of plants which are studied in the following pages. The Metaspermae are believed to be a natural group of plants properly co-ordinate with the Archegoniatae and Thallophyta (in the narrower sense). Reasons for breaking up the old Phanerogamiae, Anthophyta or Spermaphyta of the authors have been brought forward, and it is believed that many could be added. Certainly the wide difference between the seeds of Metaspermae and Archispermae stands squarely in the way of grouping them in the same grand division of the vegetable kingdom. Their separation has been proposed before (39), but not in exactly these terms. The sharp division of Sporophyta and Gamophyta has been proposed elsewhere by the writer (39½), with, however, a somewhat different limitation of the terms. Attention is directed particularly, in the preceding pages, to the characterisations of Metaspermae and Archispermae, which have the merit at least of being restatements of facts which are generally to be looked for in scattered corners of morphological treatises. These characterisations are different in essential particulars from those usually given, which are based for the most part upon

(*a*). See division into Protosporophyta, Eusporophyta and Metasporophyta in (39½) cited below.

(39). **Goebel**: *Outlines of Classification and Special Morphology*. Eng. Tran., Introd. (1887).

(39½). **MacMillan**: *Suggestions on the Classification of the Metaphyta*. Bot. Gaz. (1892).

such secondary points as the structure of the carpels. In the lines laid down above it will be seen that the *nature* of the seed is considered to be of prime morphological importance. This view, I am inclined to think, will repay study, for it serves to clear away some mists which should have been dispelled long ago, had it not happened that ancient terminologies and conservative taxonomies stood directly athwart the light.

Subdivisions of the Metaspermae. The recent researches of Treub (40) have made necessary a new subdivision of the Metaspermae more fundamental than that into the Monocotyledones and Dicotyledones. Upon examination of members of that peculiar Australasian genus, *Casuarina*, it was found that, unlike any other known Metaspermae, they were devoid of micropylar canals, and that the mature ovules split along the chalazal line and through this cleft the pollen-tube was permitted to enter. It is then proposed by Treub to divide Metaspermae into two divisions, separating the more *Selaginella*-like *Casuarinaceae* from the rest under the name of *Chalazagameae*. Plants of this division are comprised under the single rather small genus, *Casuarina*. All the rest of the Metaspermae unite, so far as known, in having a particular opening, the micropylar canal, penetrating the ovular membranes and permitting the end of the pollen-tube to be appressed against the embryo-sac (*megaspore*) in which the two eggs are developed which produce respectively the endosperm and embryo of the seed. This division is termed by Treub, *Porogameae*.

The Porogameae are divided into the Monocotyledones and Dicotyledones. In the first division the embryo undergoes a distinct type of segmentation-stages (41) and in most cases develops the apical meristem from two initials instead of from three (42). Moreover there is but one cotyledonary leaf developed.

In the Dicotyledones there are commonly three initials for the apical meristem, so that the plerome, dermatogen and periblem layers has each its own mother-cell. The segmentation stages are peculiar and moreover there are two cotyledonary leaves developed.

The Monocotyledones do not admit of further subdivisions of higher grade than the orders, as described and limited well by

(40). Treub: *Ann. Jard. Buitenz.* X. 145-231 (1891).

(41). Hanstein: *Entwicklung des Keimes der Monokotylen und Dikotylen*, pp. 1-112, taf. 1-13 (1870).

(42). Van Tieghem and Douliot: *Recherch Comp. Endogen. Member.* Ann. Sci. Nat. Bot., 7, VIII, 1 (1888), and Douliot *l. c.* 7, XI, 283 (1891).

Luerssen (43) or, not so naturally, by Van Tieghem (44). The Dicotyledones however admit of arrangement in two distinct divisions, based upon the morphological characters of the perianth. These are as follows:

(a). *Archichlamydeae*: Perianth wanting or made up of incoherent leaves owing to the failure of parts in the same foliar circle to undergo fusions.

(b). *Metachlamydeae*: Perianth exhibiting fusions between parts of the same foliar order or indicating, by accessory characters, an ancestral line in which such fusions must have taken place.

Under the classification above worked out the plants of the following list are arranged. It must be remembered that the families follow each other in precisely the order laid down in the monographers' work, in Engler and Prantl. Thus it is believed, a system as natural as available has been adopted, and the arrangement of genera and species is made to conform so far as may be practicable to the general order.

It is not improbable that the epoch-marking work of Engler and Prantl may be translated into English, but even if it is not it must for at least a decade stand as the highest and most generally accepted authority. And it is for this reason that I have preferred to follow its arrangement rather than the Benthamian which is steadily and irrevocably losing ground.

Some citations of important literature not referred to in the body of the above discussion, are here added to indicate to students where to look for the memoirs and volumes which have done so much to bring to light the four-fold complexity of our common higher plants. It will be seen from a consideration of the metaspermic characters adduced above that what we call an oak, the *Quercus macrocarpa*, for example, is not an individual like an animal, but a group of four individuals of which one only is vegetatively important while the other three, comprising both the sexual plants and one of the two sexless plants, are reduced into a condition of dependence which permits them, in ordinary parlance and in many treatises, to be discussed as organs. This condition might easily arise as a result of high differentiation and polymorphism and something like it, on a much simpler scale, is seen in animals like the copepods, in certain species of which the male is very much smaller than the female and lives parasitically upon the body of the larger crus-

(43). Luerssen: *Medicin.-Pharmac. Bot.*, Vol. I, (1882).

(44) Van Tieghem: *Traité de Botan.*, Vol. II, (1891).

tacean. But it is in the higher plants that such polymorphism reaches its unparalleled development, and in this sense, at least, we find that the higher plants are the most complicated of organisms. Only a partial list of books and memoirs can be given here.

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 “ : Entsteh. Embryo der Phanerogamen (1849).
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 “ : Kern- und Zelltheilung (1808).
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Strasburger: Coniferen und Gnetaceen (1872).
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Hanstein: Entwick. Keimes d. Monocot. u. Dicot. (1870).
Hegelmaier: Vergleich. Untersuch. u. d. Entwick. Dicot. Keime (1878).
Treub: Embryogenie Orchidaceae (1878).

Many other titles might be added to this list, but those cited will put any student into contact with the general literature. Most of these works do not devote themselves solely to the subject in the caption, but all serve to illuminate it more or less. Works of purely historical value, such as those of Brongniart, Amici, R. Brown, Schacht, Radlkofer, Karsten, et al., have not been cited, for it is not my intention to give in this place a complete bibliography of the subject, but only to cite enough works to enable readers to come in contact with the original sources.

Statistical discussions. The chapters following the list take up in order certain statistical investigations based upon facts collated in the list itself. No complete statistical investigation can be made of even this limited area, the Minnesota valley, in the present advancement of our knowledge. There are, however, data enough at hand to determine certain characters of our flora. It is believed that the points of view from which the statistics are gathered, and the principles underlying their tabulation, enable one to present some facts less barren and meaningless than those commonly put forward in such chapters. By keeping steadily in view the facts discussed above, in relation to the difference between natural and artificial districts, and with a constant comprehension of the indubitable fact that one can not consider even a natural district apart from surrounding districts, the writer has attempted to penetrate to some of the inner facts which become accessible in such a labor as has been undertaken. It is believed that the characters of the Minnesota valley flora thus determined throw some unexpected light upon the general conditions of plant distribution in this central region of the continent. And while some of the conclusions may seem simple to trained geographical botanists, it must be recalled by them that this work is not primarily addressed to any coterie of *savants* in some special line of science, but to the general public of Minnesota, under whose ultimate sanction, and by whose open-minded comprehension of the value of scientific knowledge in all departments of human activity, this Geological and Natural History Survey has been established, developed and directed.

LIST OF HIGHER SEED-PRODUCING PLANTS,

(*METASPERMÆ*),

NATIVE TO THE VALLEY OF THE MINNESOTA.

POROGAMEÆ. MONOCOTYLEDONES.

I. *TYPHACEÆ*. Cat Tail Family.

Endlicher, *Gen. Pl.* 241 (1840); Bentham and Hooker, *Gen. Plant.* III. 954 (1883); Engler in *Engler and Prantl, Nat. Pflanz.*, 2. I. 183 (1887).

Genera: 1. Swamps of tropical and temperate regions.

Species: 12 living; 2 fossil.

TYPHA LINN. Gen. 707 (1737).

Benth. and Hook., *Gen. Pl.* III. 955; Durand, *Ind. Gen. Phan.* 445. Engler and Prantl, *Nat. Pflanz.* 2, I. 186 (Solms); Schenck, *Palæophyt.* 376.

Living species, 12; tropical and temperate regions: Europe, 9; Russian Europe, 5; Russia, 5; N. America, 2; So. Sts., 1; Canada, 2; California, 2; E. Sts., 2; Rocky Mts., 1.

Fossil species: 2; Tertiary, France. Samland. (*A. Br., Stur*)

Typha latifolia LINN. Spec. 971 (1753).

T. major CURT. Fl. Lond. III, 61 (1777-1787).

T. angustifolia RICH. Tent. Fl. Abyss. II, 350 (1851).

T. latifolia var. *elongata* DUDL. Fl. Cay. 102 (1886).

Wats. and Coult., *Gray's Man.*, 6 ed. 547; Britt., Fl. N. J. 251; Upham, Fl. Minn., 135; Mac., Fl. Can. II. 69; Coult., Fl. Colo., 359; Chap., Fl. So. St. 443; Webb., Fl. Neb. 98; Watson, Fl. Calif. II, 188; Nym., Fl. Eur.; Led., Fl. Ross., IV. 1; Hook., Fl. Gt. Brit 442; Richt., Pl. Eur. 9; Herd., Fl. Eur. Russ. 122; Engl., Nat. Pflanz. II. 1, 186; Wats., King Exp. 337; Cov., Fl. Ark. 227; Hart., Fl. Scand. I. 440.

Europe, Asia and N. Africa.

North America: all Can. to N. Eng. and Fla., W. to Mts. and Sacramento, Calif.

Minn. valley: Throughout; marshes, swamps and edges of lakes.

HERB.: *Sheldon* 247, Lake Washington, Blue Earth Co.; *Taylor* 699, Minnesota Lake; *Ballard* 262, Jordan, Scott Co.; *Taylor* 408, Janesville; *Sandberg* 527, Chisago Lake; *Herrick* 280, Minneapolis; *Kassube* 222, Minneapolis.

II. SPARGANIACEAE. Burr-Reed Family.

Endlicher, *Gen. Pl.* 241 (1840); Benth. and Hook., *Gen. Pl.* III. 955 (1883); Engler in *Engl. and Prantl, Nat. Pflanz.* 2, I. 192 (1887).

Genera : 1; temperate and colder regions of Northern Hemisphere; Australia and New Zealand; swamps and marshes.

Species : 6-8 living; 2-3 extinct.

SPARGANIUM LINN. Gen. 706 (1737).

Platanaria S. F. Gray, *Arr.* II. 39 (1821).

Benth. and Hook., *Gen. Pl.* III. 955; Durand, *Ind. Gen. Phan.* 445; Engler and Prantl, *Nat. Pflanz.* 2, I. 193 (Engler); Schenck, *Palaeophyt.*, 376-377.

Living species : 6-8; temperate and colder regions of N hemisphere, Australia and New Zealand. Canada, 6; Calif., 2; E. Sts., 3.

Fossil species : 5-10 described; 2-3 distinct; Tertiary, widely distributed.

Sparganium simplex HUDS. Fl. Angl, ed. 2, 401 (1762).

S. erectum var B. LINN. Spec. 971 (1753).

S. erectum WAHL. Fl. Suec. 1020 (1824-26).

S. simplex var *nuttallii* ENGELM. Gray's Man., 5 ed. 481 (1867).

Wats. and Coult., Gray's Man., 6 ed. 548; Upham, Fl. Minn. 135; Watson, Fl. Calif., II. 188; Coult., Fl. Colo. 359; Mac., Fl. Can., II. 70, 367; Nym., Fl. Eur.; Led., Fl. Ross, IV. 4; Hook., Fl. Gt. Brit. 422; Richt., Pl. Eur. 10; Herd., Fl. Eur. Russ. 122; Engl., Nat. Pflanz., II. 1, 193; Roth., Wheel. Exp. 269; Cov., Fl. Ark. 227? Hart, Fl. Scand., I, 440.

Europe; Siberia to Dahuria.

North America: Sierras to Oregon; throughout Can. to Ft. Franklin on Mackenzie. Newf. and Vancouver; S. to Minn., Mich., N. J.

Minn. valley: N. E. district; infrequent; swamps, marshes and edges of lakes.

HERB.: *Roberts* 124, Agate Bay; *Sandberg* 529, Red Wing; var. *fluitans* — *Bailey* 85, Vermilion Lake; *MacM. and Sheld.* 27, Cass Co.

Sparganium androcladum (ENGELM.) MORONG, *Torr. Bull* XV. 78 (1888).

S. simplex var. *androcladum* ENGELM. Gray's Man. 5 ed. 481 (1867).

S. ramosum AUCT. AMER. in part.

Wats. and Coult., Gray's Man. 6 ed. 548; Britt., Fl. N. J. 252; Upham, Fl. Minn. 136; Coult., Fl. Colo. 360; Mac., Fl. Can., II. 60; Cov., Fl. Ark. 227.

North America: N. S., N. Br., Q., Ont., Man., Saskatchewan and Vancouver; S. to Colo., Minn., Mo., N. Eng., N. J. and Fla.

Minn. valley: Reported from the S. E. district, rare; swamps, marshes and edges of lakes.

Sparganium eurycarpum ENGELM. Gray's Man. 2d ed. (1852).

Wats. and Coult., Gray's Man. 6 ed. 548; Britt., Fl. N. J. 252; Webb., Fl. Neb. 98; Mac., Fl. Can. II. 69; Wats., Fl. Calif. II. 188; Coult., Fl. Colo. 359; Chap., Fl. So. St. 443; Upham, Fl. Minn. 135; Wats., King Exp. 337; Roth., Wheel. Exp. 269.

North America: Newf., N. S., Ont., Man. to Humboldt River, Nev.; S. to N. Eng., N. J., Va.; W. to Minn., Neb. and Kan.

Minn. valley: Throughout; swamps, marshes and edges of lakes.

HERB.: *Sheldon* 253, Lake Washington, Le Sueur Co.; *Taylor* 1109, Glenwood; *Taylor* 522, Mud Lake; *Taylor* 673, Minnesota Lake; *Sheldon* 991, Cross Lake, Brown Co.; *Sheldon* 644, Waseca; *Ballard* 111, Shakopee; *Sandberg* 528, Red Wing; *Holzinger* 263, Winona Co.

III. POTAMOGETONACEAE. Pond-Weed Family.

Zosteraceae Lindl. *Veg. King*. 145 (1846) p. p.

Najadaceae Benth. and Hook., *Gen. Pl.* III. 1009 (1883); (Excl. Tribus I, *Juncagineae*. Tribus II, *Apogetoneae*. Tribus VII, *Najadeae*); Ascherson in *Engl. and Prantl, Nat. Pflanz.* 2, I. 194 (1889).

Genera: 9 living; 3 extinct; cosmopolitan; aquatic, principally in fresh water.

Species: 75± living; 20-30 ? extinct.

POTAMOGETON LINN. *Gen.* 92 (1737)

Peltopsis Raf. *Jour. Phys.* LXXXIX, 101 (1819).

Spirillus and **Groenlandica** J. Gay, *Comptes Rendus*, Avr. (1854).

Benth. and Hook., *Gen. Pl.* III, 1014; Durand, *Ind. Gen. Phan.* 453; Engler and Prantl, *Nat. Pflanz.* 2, I, 207; Schenck, *Palaeophyt.*, 381-383.

Living species: 50±; fresh and rarely brackish waters; cosmopolitan. Russia, 25; Europe, 38; N. America, 35 (15 endemic); California, 19; Canada, 27; E. Sts., 29; Rocky Mts., 11; Pl. King., 10; Pl. Wheel., 4; S. Sts., 10.

Fossil species: Tertiary; numerous forms described but all rather doubtful; 2 sp. clearer than the rest. Oeningen (*A. Br.*); S. France (*Saporta*).

Potamogeton natans LINN. Spec. 126 (1753).

Wats. and Coult., Gray's Man. 6 ed. 553; Britt., Fl. N. J. 257; Webb., Fl. Neb. 97; Upham, Fl. Minn. 136; Chap., Fl. So. St. 446; Wats., Fl. Calif. II, 195; Mac., Fl. Can. II, 81; Coult., Fl. Colo. 362; Nym., Fl. Eur.; Led., Fl. Ross. IV, 23; Hook., Fl. Gt. Brit. 431; Richt., Pl. Eur. 11; Herd., Fl. Eur. Russ. 124; Engl., Ascherson, Nat. Pflanz. II, 1 207; Wats., King Exp 337; Cov. Fl. Ark. 228; Hart, Fl. Scand. I, 431; Rothr., Alask. 445.

Europe; Asia; Australia; Africa.

North America: Anticosti, N. S., N. Br., Q., Ont., Owen Sound to Man. and Lake Athabasca; N. to Hudson Bay and Alaska; Vancouver; S. to Calif., Nev., Utah, N. Mex.; E. to N. Eng., N. J. and Fla.

Minn. valley: Throughout; abundant; ponds, lakes and sluggish streams.

HERB.: *Ballard*, 782, Swan Lake, Carver Co.; *Ballard*, 587, Crystal Lake, Scott Co.; *Ballard*, 858, Page Lake, Carver Co.; *Ballard* 276, Jordan, Scott Co.; *Ballard* 321, Belle Plaine; *Ballard* 431, Prior's Lake, Scott Co.; *Sheldon* 723, Cottonwood river, near Sleepy Eye; *Ballard* 900, Waconia; *Taylor* 1072, Douglas Co.; *Sheldon* 273, Duck Lake, Blue Earth Co.; *Sheldon* 1088, Springfield; *Kassube* 223, Rocky Lake; *Herrick* 281, Minnetonka; *Holzinger* 265, Winona Co.; *Bailey* 391, Mud Lake; *Sandberg* 531, Chisago Co.; *Herb. Sheld.* 1693, Minneapolis.

Potamogeton fluitans ROTH. Fl. Germ. I, 72 (1788).

P. natans var. *fluitans* CHAM. Adnot. 4 (1815).

P. petiolaris PR. Del. Pr. I, 151 (1822).

P. natans var. *angustatus* M. and K. Röhl. Fl. D. I, 836 (1823).

P. oblongus MEY. Chlor. Hann. 519 (1836).

?*P. lonchites* TUCKERM. Am. Jour. Sci. 2, VI, 226 (1848).

Wats. and Coult., Gray's Man. 6 ed. 560; Britt., Fl. N. J. 257; Upham, Fl. Minn. 136; Mac., Fl. Can. II, 83, 369; Wats., Fl. Calif. II, 196; Coult., Fl. Colo. 363; Chap., Fl. So. St. 446; Hook., Fl. Gt. Brit., 432?; Richt., Pl. Eur. 12; Herd., Fl. Eur. Russ. 124; Engl., Ascherson, Nat. Pflanz. II, 1, 207; Wats., King Exp. 337; Hart., Fl. Scand. I, 431; Webb, Appx. Neb. 22.

All Europe: cosmopolitan.

North America: N. Br., Ont. to N. J.; W. to Minn., Iowa, Neb., Mex.; also Washington to Nevada.

Minn. valley: Reported from S. central district; probably local.

Potamogeton amplifolius TUCKERM. Am. Jour. Sci. 2, VI. 225 (1848).

Wats. and Coult., Gray's Man. 6 ed. 561; Britt., Fl. N. J. 257; Upham, Fl. Minn. 136; Wats., Fl. Calif. II, 196; Mac., Fl. Can. II, 84; Coult., Fl. Colo. 363; Chap., Suppl. So. St. 652; Cov., Fl. Ark. 228; Webb., Appx. Neb. 22.

North America: Ont., N. Superior reg., Man. to Vancouver, Oregon and Calif.; S. to N. Eng., N. J. and mts. of Ga.; W. to Minn., Neb., Kan., Ark., N. Mex.

Minn. valley: Forest district; frequent; lakes and ponds.

HERB.: *Sheldon* 318, Madison, Blue Earth Co.; *Ballard* 599, Prior's Lake, Scott Co.; *Ballard* 606, Prior's Lake, Scott Co.; *Sandberg* 532, Chisago Co.

Potamogeton perfoliatus LINN. Spec. 126 (1753).

P. loeselii R. and S. Syst. III, 508 (1818).

Peltopsis perfoliata RAF. Jour. Phys. LXXXIX, 102 (1819).

Potamogeton crispus DARL. Fl. Cestr. 23 (1826).

Wats. and Coult., Gray's Man. 6 ed. 562; Britt., Fl. N. J. 258; Upham, Fl. Minn. 137; Mac., Fl. Can. II, 85; Wats., Fl. Calif. II, 197; Chap., Fl. So. St. 446; Coult., Fl. Colo. 363; Hook., Fl. Gt. Brit., 434; Nym. Fl. Eur.; Led., Fl. Ross. IV, 27; Trautv., Fl. Sib. 113; Richt., Pl. Eur. 13; Herd., Fl. Eur. Russ. 124; Engl., Ascherson, Nat. Pflanz. II, 1, 207; Wats., King Exp. 337; Roth., Wheel., Exp. 268?; Hart., Fl. Scand. I, 434.

Europe; all Russia and Siberia; N. Africa; Australia.

North America: N. S., N. Br., Anticosti, Q., Ont., to valley of Slave river, N. W. T.; S. to N. Eng., N. J., Fla.; W. to Minn., Iowa and Colo.?

Minn. valley: Throughout; abundant; ponds and lakes.

HERB.: *Ballard* 601, Prior's Lake, Scott Co.; *Ballard* 865, Page Lake, Carver Co.; *Taylor* 67, Elysian; *Taylor* 140, Janesville; *Taylor* 1050, Glenwood; *Ballard* 449, Prior's Lake, Scott Co.; *Sheldon* 440, Buffalo Lake, Waseca Co.; *Oestlund* 185, Minnehaha; *Herrick* 284, Minnetonka; *Roberts* 125, Knife river; *Herb. Sheld.* 1752, Lake Johanna, Ramsey Co.

Potamogeton heterophyllos SCHREB. Spic. 21 (1771).

P. hybridus PENTAGN. Inst. II, 289 (1787).

P. gramineus ROTH. Tent. Fl. Germ. I, 74 (1788).

P. palustris TEESD. Trans. Linn. Soc. V, 43 (1800).

P. gramineus var. *heterophyllos* FRIES, Nov. Fl. Suec. 35 (1828).

P. paucifolius OP. Böhm. Fl. 23 (1823).

P. proteus f. *heterophyllos* CHAM. and SCHLECHT. Linn. II, 201 (1827).

Wats. and Coult., Gray's Man. 6 ed. 561; Britt., Fl. N. J. 257?; Upham, Fl. Minn. 136; Coult., Fl. Colo. 363; Mac., Fl. Can. II, 84; Chap., Fl. So. St.

446; Wats., Fl. Calif. II, 196; Hook., Fl. Gt. Brit., 432; Richt., Pl. Eur. 13; Herd., Fl. Eur. Russ. 124; Engl., Ascherson, Nat. Pflanz. II, 1, 207; Mac., Fl. Can. II, 270; Roth., Wheel., Exp. 268; Hart., Fl. Scand. I, 432.

Europe; N. Asia.

North America: Q., Saskatchewan and Rocky Mts. to Vancouver; S. to Yellowstone and Mono Pass, Calif.; E. to N. Eng., N. J. and N. Car.

Minn. valley: Forest district and probably W.; ponds and lakes.

HERB.: *Ballard 899*, Waconia; *Ballard 860*, Page Lake, Carver Co.; *Ballard 859*, Page Lake, Carver Co.; *Bailey in herb. Morong*, Vermilion Lake.

Potamogeton gramineus LINN. var. **zizii** (ROTH.) M. and K. in Rühl. Fl. D. I, 845 (1823).

P. zizii ROTH. Tent. Fl. Germ. I, 75 (1788).

P. angustifolius OP. Böhm. Gerd. 23 (1823).

P. proteus f. *zizii* CHAM. and SCHLECHT. Linn. II, 201 (1827).

P. lucens var. *minor* UPHAM, Fl. Minn. 136 (1883).

Wats. and Coult., Gray's Man. 6 ed. 561; Britt., Fl. N. J. 258; Mac., Fl. Can. II, 85; Hook., Fl. Gt. Brit. 433; Richt., Pl. Eur. 14; Mac., Fl. Can. II, 370; Hart., Fl. Scand. I, 433.

Europe; Asia?

North America: Q., Ont. to N. Eng., N. J. and Fla.; W. to Minn. and Kan.

Minn. valley: N. E. district, rare; ponds and lakes.

HERB.: *Herrick 283*, Minnetonka.

Potamogeton illinoensis MORONG, Bot. Gaz. V. (1880).

Wats. and Coult., Gray's Man. 6 ed. 561; Upham, Fl. Minn. 137.

North America: W. N. Y. to Ills., Iowa and Minn.

Minn. valley: Reported from S. edge; ponds and lakes.

Potamogeton pusillus LINN. Spec. 127 (1753).

P. acutifolius PR. Fl. Cech. 37 (1819).

P. gramineus MER. Fl. Par. II, 70 (1836).

P. berchtholdii FIEB. in Berchth. Fl. Böhm. II, 277 (1839).

P. mucronatus NYM. Syll. 387 (1854-55).

Wats. and Coult., Gray's Man. 6 ed. 563; Britt., Fl. N. J. 258; Upham, Fl. Minn. 137; Mac., Fl. Can. II, 87; Wats., Fl. Calif. II, 198; Coult., Fl. Colo. 363; Hook., Fl. Gt. Brit. 435; Led., Fl. Ross. IV, 29; Richt., Pl. Eur. 30; Herd., Fl. Eur. Russ. 124; Engl. Ascherson, Nat. Pflanz. II, 1, 208; Wats., King Exp. 338; Hart., Fl. Scand. I, 435.

N. Europe; N. Africa; N. and S. America; N. Asia.

North America: N. S., N. Br., Q., Ont. to Man., Saskatchewan, Prairie region to Brit. Col., lat. 55° N.; S. to N. Eng., N. J., Minn., Mo., Uintah Mts., Santa Cruz and the Tuolumne.

Minn. valley: Throughout; ponds and lakes; abundant.

HERB.: *Taylor* 105, Janesville; *Ballard* 447, Prior's Lake, Scott Co.; *Herrick* 285, Minnetonka; *Bailey* 394, Mud Lake; *Bailey* 538, Long Lake—*var. tenuissimus*; *Bailey* 369, Vermilion Lake, in herb. *Morong*.

Potamogeton rutilus WOLFG. Schult. Mant. III, 362 (1827).

P. compressus SM. Engl. Bot. t. 418 (1796) not Linn.

P. pusillus var. *major* FRIES, Nov. Ed. II, 48 (1828).

P. friesii RUPR. Ber. Russ. Rech. IV, 43 (1845).

P. oederi MEY. Fl. Hann. 536 (1849).

P. major MORONG in Litt. (1892).

Wats. and Coult., Gray's Man. 6 ed. 563; Mac., Fl. Can. II, 88, 371; Led., Fl. Ross. IV. 30; Hook., Fl. Gt. Brit. 435; Herd., Fl. Eur. Russ. 124; Engl., Asch., Nat. Pflanz. 2, I. 208; Richt., Pl. Eur. 15.

Middle Europe and Asia; N. Africa.

North America: N. S., Anticosti, N. Br., Q., N. E. T., Man. and Brit. Col.; S. to W. N. Y., Mich. and Minn.

Minn. valley: S. and N. E. districts; rare; ponds and lakes.

HERB.: *Bailey* 369, Mud Lake; *Cratty*, State Line, S. edge, *Herb. Morong*.

Potamogeton pectinatus LINN. Spec. 127 (1753).

P. interruptus KIT. in Schultes Ostr. Fl. I, 328 (1794).

P. vaillantii R. and S. Syst. III, 514 (1818).

P. fasciculatus WOLFG. in Schultes Mant. III, 364 (1827).

P. filicaulis SCHUR. Enum. 633 (1866).

Wats. and Coult., Gray's Man. 6 ed. 564; Britt., Fl. N. J. 258; Coult., Fl. Colo. 364; Mac., Fl. Can. II. 88; Chap., Fl. So. St. 445; Upham, Fl. Minn. 137; Wats., Fl. Calif. II. 198; Trautv., Fl. Sib. 113; Led., Fl. Ross. IV. 30; Nym., Fl. Eur.; Hook., Fl. Gt. Brit. 436; Richt., Pl. Eur. 15; Herd., Fl. Eur. Russ. 124; Engl., Ascherson, Nat. Pflanz. II, 1, 208; Wats., King Exp. 338; Roth. Wheel. Exp. 288; Hart., Fl. Scand. I. 437; Webb., Appx. Neb. 22.

Europe; N. Asia to N. W. India; Australia.

North America: Greenland and N. S. to Man., Rocky Mts., Hudson Bay; Brit. Col. and Vancouver; N. to lat. 62°; S. to Fla. and W. to Rockies through U. S.; also Washington to S. Calif., Nev. and Utah.

Minn. valley: Throughout; frequent; ponds and lakes.

HERB.: *Taylor* 104, Glenwood; *Sheldon* 439, Buffalo Lake, Waseca Co.; *Taylor* 643, Minnesota Lake; *Sheldon* 871, Sleepy Eye; *Oestlund* 186, Minnehaha; *Holzinger* 268, Winona Co.; *Bailey* 124, Vermilion Lake.

Potamogeton lucens LINN. Spec. 126 (1753).

P. serratus WEBB. Pr. Fl. Holst. 16 (1780).

P. lucidus GULDENST. It. I. 76 (1787).

P. acuminatus SCHUM. Enum. Sill. I, 49 (1801).

P. volhynicus BESS., R. and S. Syst. III, 509 (1818).

P. cornutus PR. Fl. Cech. 37 (1819).

P. caudatus SEID. Op. Böhm. Gew. 23 (1823).

P. proteus f. *lucens* CHAM. and SCHLECHT. Linn. II, 197 (1827).

Wats. and Coult., Gray's Man. 6 ed. 562; Upham, Fl. Minn. 136; Mac., Fl. Can. II. 85; Chap., Fl. So. St. 446?; Wats., Fl. Calif. II. 196; Coult., Fl. Colo. 363; Hook., Fl. Gt. Brit. 432; Nym., Fl. Eur.: Led., Fl. Ross. IV. 26; Richt., Pl. Eur. 14; Herd., Fl. Eur. Russ. 124; Hart., Fl. Scand. I 433.

Europe; Asia; N. Africa; Australia; W. Indies.

North America: N. S., Q., Ont. to Keewatin; S. to Minn., Ark., N. Mex.; E. to N. Eng. and Fla?; also California.

Minn. valley: Throughout; infrequent; ponds and lakes.

HERB.: *Taylor* 1002, Glenwood; *Oestlund* 184, Minnehaha; *Herrick* 282, Minnetonka; *Ballard* 600, Prior's Lake, Scott Co.

Potamogeton praelongus WULF. Roem. Arch. III, 331 (1803-5).

P. lucens WEBB. Prim. Holst. 15 (1780) not Linn.

P. flexicaule DETH. Strel. Anz. n 50 (1809).

P. flexuosus (SCHL. and) WRED. Meckl. Fl. I (1811).

P. acuminatus WAHL. Fl. Ups. 116 (1820).

Wats. and Coult., Gray's Man. 6 ed. 562; Britt., Fl. N. J. 258; Richt., Pl. Eur. 14; Mac., Fl. Can. II. 85; Hook., Fl. Gt. Brit. 433; Nym., Fl. Eur., Wats., Fl. Calif. II. 197.

Europe.

North America: N. S. to Vancouver; S. to Mass., Minn., Iowa.

Minn. valley: Forest district; ponds and lakes or sluggish streams.

HERB.: *Sheldon* 319, Madison Lake; *Bailey* 404, Burnt-side Lake.

Potamogeton lanceolatus SM. Engl. Bot. 1985 (1808).

P. perfoliatus var. *lanceolatus* ROBBINS, Gray's Man. 5 ed. (1868).

P. perfoliatus var. *richardsonii* BENNETT, Mac. Fl. Can. II, 370 (1890) in part?

Wats. and Coult., Gray's Man. 6 ed. 562; Coult., Fl. Colo. 363; Wats., Fl. Calif. II. 197; Mac., Fl. Can. II. 86; Upham, Fl. Minn. 137; Hook., Fl. Gt. Brit. 434; Richt., Pl. Eur. 13; Roth., Wheel. Exp. 268?.

Europe.

North America: Ont. to Rockies and 62° N. lat.; S. to N. J., Fla. and N. Mex.; W. to Pac. coast and Yellowstone basin.

Minn. valley: Forest district and probably W.; ponds and streams.

HERB.: *Holzinger* 266, Winona Co.; *Bailey* 149, Vermilion Lake, and *Sandberg*, Hennepin Co., in herb. *Morong*.

Potamogeton zosteræfolius SCHUM. Fl. Säll. I, 50 (1801).*?P. complanatus* WILLD. Berl. Mag. 297 (1809).*?P. cuspidatus* SCHRAD. Ex. Sm. Engl. Fl. I, 234 (1824).*P. zosterophyllus* DUM. Fl. Belg. 164 (1827).*P. compressus*. AUCT. AM., not Linn.

Wats. and Coult., Gray's Man. 6 ed. 562; Britt., Fl. N. J. 258; Upham, Fl. Minn. 137; Mac., Fl. Can. II. 86; Wats., Fl. Calif. II. 197; Hook., Fl. Gt. Brit. 434; Led., Fl. Ross. IV. 29; Nym., Fl. Eur.; Richt., Pl. Eur. 14; Herd., Fl. Eur. Russ. 124, 126; Cov., Fl. Ark. 228; Webb, Appx, Neb. 22.

Europe; N. Asia to Baikal Mts.

North America: N. Br., Ont., L. Superior region and N. Saskatchewan to 57° N. lat.; Oregon and N. Calif.; N. Eng. to N. J.; W. to Minn., Dak., Iowa and Neb.

Minn. valley: Forest district; ponds and lakes.

HERB.: *Ballard* 642 n., Page Lake, Carver Co.; *Ballard* 456, Prior's Lake, Scott Co.; *Ballard* 598, Prior's Lake, Scott Co.; *Holzinger* 267, Winona Co.; *Bailey* 545, Long Lake; *Bailey* 403, Burntside Lake; *W. Upham in herb. Morong*, Mankato.

Potamogeton foliosus RAF. Med. Rep. (III), II, 409 (1811).*P. pauciflorus* PURSH, Fl. Am. (1814) not Lam.*P. purshianus* MORONG in Litt. (1892).

Wats. and Coult., Gray's Man. 6 ed. 563; Britt., Fl. N. J. 258; Upham, Fl. Minn. 137; Webb., Fl. Neb. 97; Wats., Fl. Calif. II. 197; Mac., Fl. Can. II. 86; Chap., Fl. So. St. 446.

North America: N. Br., Q., Ont. to N. Superior region, Saskatchewan and Hudson Bay; Oregon to central Calif.; N. Eng. to N. J. and Ga.; W. to Iowa, Minn., Neb. and Kan.

Minn. valley: Forest district; ponds and lakes.

HERB.: *Upham*, Mankato, in *herb Morong*.**ZANICHELLIA** LINN. Gen. 700 (1737).

Benth. and Hook., *Gen. Pl.* III. 1016; Durand, *Ind. Gen. Phan.* 453; Engler and Prantl, *Nat. Pflanz.* 2, I, 213 (Ascherson).

Living species: 9 described; only 1 distinct. Cosmopolitan, but wanting in Australia.

Zanichellia palustris LINN. Spec. 969 (1753).*Z. geniculata* GILIB. Exerc. Phyt. II. 419 (1792).*Z. repens* BNGH. Fl. Mon. Prodr. 273 (1824).*Z. major* BNGH. Reich. Icon. VIII. 24 (1830).*Z. radicans* WALLM. Flora, Lit. Bl. 20 (1841).*Z. macrostemon* GAY, WILLK. and LGE. Prodr. I, 26 (1870).

Wats. and Coult., Gray's Man. 6 ed. 565; Britt., Fl. N. J. 259; Mac, Fl. Can. II. 90; Webb., Fl. Neb. 96; Wats., Fl. Calif. II. 193; Coult., Fl. Colo. 362; Upham, Fl. Minn. 136; Chap., Fl. So. St. 445; Hook., Fl. Gt. Brit. 437; Nym., Fl. Eur.; Richt., Pl. Eur. 17; Herd., Fl. Eur. Russ. 124; Engl., Ascherson, *Nat. Pflanz.* II, 1, 213; Wats., *King Exp.* 337; Led., Fl. Ross. IV. 22.

Europe; Asia; North Africa; Philippines; Australia.

North America: Anticosti, N. S., Q., Ont., N. E. T., Saskatchewan and Man.; S. to N. J. and Fla.; W. to Oregon, Utah, Calif. and N. Mex.

Minn. valley: Reported from S. central region; peat bogs; rare.

HERB.: ?*Sandberg 530*, Goodhue Co.

IV. NAJADACEAE. Naiad Family.

Najadeae (Tribus VII, Najadaceae) Benth. and Hook., *Gen. Pl.* III. 1011 (1883); Magnus in *Eng. and Prantl, Nat. Pflanz.* 2, I. 214 (1889)

Genera: 1; temperate and tropical regions.

Species: 10-12 living; 1-2 extinct.

NAJAS LINN. Gen. 701 (1737).

Fluvialis MICHEL. *Nov. Gen.* t. 8 1729), and Pers. *Syn.* II. 530 (1807).

Caulinia WILLD. *Mem. Acad. Berl.* 87 (1798).

Ittnera GMEL. *Fl. Bad.* III, t. 4 (1808).

Benth. and Hook., *Gen. Pl.* III, 1018; Durand, *Ind. Gen. Phan.* 453; Engler and Prantl, *Nat. Pflanz.* 2, I, 217 (Magnus); Schenck, *Palaeophyt.*, 380.

Living species: 10-12; temperate and tropical regions: Europe, 4; Russian Europe, 3; N. America, 4; E. Sts., 3; California, 2; Canada, 1; So. Sts., 3; Pl. Wheel., 1.

Fossil species: Upper cretaceous and tertiary.

Najas flexilis (WILLD.) ROSTK. and SCHM., *Fl. Sed.* 382 (1824).

Caulinia flexilis WILLD. *Act. Acad. Berol.* 88 (1798).

Fluvialis flexilis PERS. *Syn.* II, 530 (1807).

Najas graminea ROSTK. in *Link. H. C.* I, 287 (1829).

Wats. and Coult., *Gray's Man.* 6 ed. 566; Britt., *Fl. N. J.* 259; Mac., *Fl. Can.* II. 91; Upham, *Fl. Minn.* 136; Chap., *Fl. So. St.* 444; Wats., *Fl. Calif.* II, 191; Nym., *Fl. Eur.*; Hook., *Fl. Gt. Brit.* 439; Richt., *Pl. Eur.* 18; Herd. *Fl. Eur. Russ.* 126; Engl. Magnus, *Nat. Pflanz.* II. 1, 217; Hart., *Fl. Scand.* I, 404; Webb., *Appx. Neb.* 22.

Great Britain, Scandinavia, N. Germany, Russia, Siberia; Mexico; W. Indies.

North America: N. S., N. Br., Q., Ont. to Man., Brit. Col. and Pac.; S. to N. Eng., N. J. and S. Car.; W. to Minn., Iowa and Neb.; S. to San Francisco on Pac. coast.

Minn. valley: Throughout; infrequent or locally abundant; lakes, ponds and sluggish streams.

HERB.: *Taylor 450*, Lake Helena, Waseca Co.; *Sheldon 910*, Cottonwood river, near Sleepy Eye; *Holzinger 264*, Winona Lake; *Oestlund 183*, Minnehaha; *Bailey 389*, Mud Lake.

V. JUNCAGINEAE. Arrow-Grass Family.

Endlicher, *Gen. Pl.* 127 (1840); Benth. and Hook., *Gen. Pl.* III. 1010 (1883), *Tribus I, Najadaceae*; Buchenau and Hieronymus in *Engl. and Prantl, Nat. Pflanz.* 2, I, 222 (1889).

Genera: 4 living; 2 extinct; temperate regions to Magellan straits and Australia.

Species: 15 living; 2 extinct.

TRIGLOCHIN LINN. Gen. 302 (1737).

Juncago TOURN. *Inst.* (1700).

Cynogeton ENDL. *Ann. Wien. Mus.* II, 210 (1840).

Maundia F. MULL. *Frag. Phyt. Austral.* I. 23 (1861?).

Benth. and Hook. *Gen. Pl.* III, 1012; Durand, *Ind. Gen. Phan.* 452; Engler and Prantl, *Nat. Pflanz.* 2, I, 224 (Buchenau and Hieronymus).

Living species: 12; temperate and colder regions. Russia, 4; Europe, 5; Russian Europe, 2; N. America, 2; Canada, 2; E. Sts., 2; So. Sts., 1; Rocky Mts., 2; Pl. King, 2; California, 1; Pl. Wheel., 2.

Triglochin palustris LINN. Spec. 338 (1753).

T. juncea GILIB. *Exerc. Phyt.* II, 501 (1792).

Juncago palustris MOENCH, *Meth.* 644 (1794).

Triglochin chilensis MEYEN, *Reise I*, 354 (1835).

Wats. and Coult., *Gray's Man.* 6 ed. 557; Upham, *Fl. Minn.* 138; Mac., *Fl. Can.* II. 79; Wats., *Fl. Calif.* II, 199; Coult., *Fl. Colo.* 364; Trautv., *Fl. Sib.* 113; Nym., *Fl. Eur.*; Led., *Fl. Ross.* IV. 35; Hook., *Fl. Gt. Brit.* 430; Richt., *Pl. Eur.* 18; Herd., *Fl. Eur. Russ.* 124; Engl. Buchanau, *Nat. Pflanz.* II. 1, 224; Wats., *King Exp.* 340; Roth, *Wheel. Exp.* 268; Hart., *Fl. Scand.* I, 417; Rothr., *Alask.* 446.

Europe; Asia; Africa; S. America.

North America: Labrador, N. Br., Q., Ont. to Man., Little Slave Lake, Bartlett Bay and Alaska; W. to Rocky Mts.; S. to N. Y., Ill., Minn., Dak. and Mont.; in Rockies to N. Mex. and Mexico.

Minn. valley: S. central district and probably sparingly throughout; peat bogs.

HERB.: *Leiberg* 63, 64, Blue Earth Co.

Triglochin maritima LINN. Spec. 339 (1753).

T. mexicana H. B. K. *N. Gen. et Spec.* I, 244 (1815).

T. elata NUTT. *Gen. I*, 237 (1818).

T. salina WALLR. *Linn. XIV*, 567 (1840).

T. maritima var. *elata* GRAY, *Man. ed. V*, 491 (1867).

Wats. and Coult., *Gray's Man.* 6 ed. 558; Britt., *Fl. N. J.* 256; Coult., *Fl. Colo.* 364; Webb., *Fl. Neb.* 97; Upham, *Fl. Minn.* 138; Mac., *Fl. Can.* II, 80; Wats., *Fl. Calif.* II, 199; Hook., *Fl. Gt. Brit.* 430; Nym., *Fl. Eur.*; Led., *Fl. Ross.* IV, 35; Trautv., *Fl. Sib.* 113; Richt., *Pl. Eur.* 19; Herd., *Fl. Eur. Russ.* 124; Engl., Buchenau *Nat. Pflanz.* II, 1, 224; Wats., *King Exp.* 340; Roth., *Wheel. Exp.* 268; Hart., *Fl. Scand.* I, 417; Rothr., *Alask.* 446.

Europe; Asia; Africa; S. to Caucasus and Dahuria.

North America: Atlantic coast from Labrador to N. J.; also San Francisco to Arctic ocean and Alaska; interior from mts. of Colo. to N. Mex. and E. to the coast in saline places.

Minn. valley: Throughout; S. central district, abundant; marshes and peat bogs.

HERB.: *Taylor* 732, Glenwood; *Ballard* 809, Page Lake, Carver Co.; *Ballard* 359, Helena, Scott Co.; *Ballard* 624, Chaska; *Leiberg* 65, Blue Earth Co.; *Herrick* 286, Minneapolis; the rest are var. *elatum* (Nutt.). *Herrick* 287, Minneapolis; *Bailey* 326, St. Louis river; *Sandberg* 533, Chisago Lake.

SCHEUCHZERIA LINN. Gen. 301 (1737).

Benth. and Hook., *Gen. Pl.* III, 1012; Durand, *Ind. Gen. Phan.* 453; Engler and Prantl, *Nat. Pflanz.* 2, I, 225 (Buchenau and Hieronymus); Schenck, *Palaeophyt.* 388.

Living species: 1; N. temperate and boreal regions.

Fossil species: Cretaceous; *Lamprocarpites*, Greenland (*Heer*).

Scheuchzeria palustris LINN. Spec. 338 (1753).

S. paniculata GILIB. Exerc. Phyt. II, 502 (1792).

S. asiatica MIQ. Fl. Ind. Bat. III, 243 (1837?).

Wats. and Coult., Gray's Man. 6 ed. 558; Britt., Fl. N. J. 256; Coult., Fl. Colo. 364; Upham, Fl. Minn. 138; Mac., Fl. Can. II, 81; Wats., Fl. Calif. II, 199; Led., Fl. Ross. IV. 37; Nym., Fl. Eur.; Hook., Fl. Gt. Brit. 430; Richt., Pl. Eur. 19; Herd., Fl. Eur. Russ. 124; Engl. Buchenau, Nat. Pflanz. II. 1, 225; Hart., Fl. Scand. I, 416.

Middle and N. Europe; N. Asia.

North America: N. Br. Ont. to Hudson Bay, Georgian Bay, Keewatin and Rocky Mts.; S. to N. J. and W. to Minn., Dak., Mont. and Colo.; also Washington to Sierra Co., Calif.

Minn. valley: Throughout, but local or rare; peat bogs and wet places in marshy meadows.

HERB.: *Taylor* 1113, Glenwood; *Bailey* 305, St. Louis river; *Sandberg* 534, Chisago Co.

VI. ALISMACEAE. Water-Plantain Family.

Endlicher, *Gen. Pl.* 127 (1840) in part; Benth. and Hook. *Gen. Pl.* III. 1003 (1883), excl. *Tribus II, Butomeae*; Buchenau, *Engl. and Prantl, Nat. Pflanz.* 2, I, 227 (1889).

Genera: 10; temperate and warmer regions.

Species: 55± living; 4-5 extinct.

ALISMA LINN. Gen. 308 (1737).**Caldesia** PARLAT. *Fl. It.* III, 598 (1862?).**Baldellia** PARLAT. *Nuovo. Gen. Monoc.* 57 (1854).**Helanthium** ENGELM. Mss. *ex. Benth. and Hook. l. c.* (1883).

Benth. and Hook. *Gen. Pl.* III, 1004; Durand, *Ind. Gen. Phan.* 452; Engler and Prantl, *Nat. Pflanz.* 2, I, 230 (Buchenau); Schenck, *Paleophyt.*, 388.

Living species: 5–10; Europe; temperate and tropical Asia; tropical Africa; Australia; N. and S. America. Russia, 4; Europe, 5; U. S., 2; 1, continental; 1, Pac. coast.

Fossil species: 3–4; Cretaceous, Greenland (*Heer*); Tertiary, Greenland and Spitzbergen (*Heer*); France (*Saporta*). All doubtful.

Alisma plantago LINN. Spec. 342 (1753).*A. natans* POLL. *Pl. Pal.* III, 319 (1777).*A. latifolium* GILIB. *Fl. Lith.* V, 222 (1781).*A. ranunculoides* ALL. *Fl. Ped.* I, 234 (1785).*A. angustifolium* HOPPE, *Taschenb.* 13 (1797).*A. plantago* var. *americanum* R and S. *Syst.* III (1818).*A. trivialis* and *parviflora* PURSH, *Fl. Am.* 252 (1814).? *A. subcordatum* RAF. *Med. Rep.* V, 356 (1809).? *A. odorata* RAF. *Fl. Lud.* (1817).? *A. roseum* RAF. *Ex. Steud. Nom.**A. lanceolatum* SCHULTZE, *Spreng Syst.* II, 163 (1825).*A. plantago* var. *triviale* B. S. P. *Cat. N. Y.* (1888).

Wats. and Coult., *Gray's Man.* 6 ed. 554; Britt. *Fl. N. J.* 255; Coult. *Fl. Colo.* 361; Webb., *Fl. Neb.* 97; Mac., *Fl. Can.* II, 76; Wats., *Fl. Calif.* II, 200; Chap., *Fl. So. St.* 448; Hook., *Fl. Gt. Brit.* 427; Nym., *Fl. Eur.*; Led. *Fl. Ross.* IV, 39; Trautv., *Fl. Sib.* 113; Richt., *Pl. Eur.* 19; Herd. *Fl. Eur. Russ.* 124; Engl. *Buchenau, Nat. Pflanz.* II, 1, 230; Wats., *King Exp.* 340; Cov., *Fl. Ark.* 228; Hart., *Fl. Scand.* I, 415.

Europe; Asia, Australia; N. Africa.

North America: Newf. to Rockies and Pac.; S. to N. California and E. to N. Eng. and N. Ga.

Minn. valley: Throughout; abundant; marshes and edges of lakes or shallow edges of slow streams.

HERB.: *Taylor* 220, Janesville; *Ballard* 821, Page Lake; *Ballard* 264, Jordan; *Taylor* 730, Glenwood; *Ballard* 789, Swan Lake; *Ballard* 609, Chaska; *Sheldon* 922, Sleepy Eye; *Taylor* 609, Minnesota Lake; *Kassube* 225, Minneapolis; *Oestlund* 187, Hennepin Co.; *Holzinger* 269, Winona Co.; *Sandberg* 535, Goodhue Co.; *MacM. and Sheld.* 51, Brainerd; *Herb. Moyer* 229, Montevideo.

SAGITTARIA LINN. Gen. 723 (1737).**Lophiocarpus** MICH. *D. C. Mon. Phan.* III, 60 (1881).

Benth. and Hook., *Gen. Pl.* III, 1006; Durand, *Ind. Gen. Phan.* 452; Engler and Prantl, *Nat. Pflanz.* 2, I, 231 (Buchenau); Schenck, *Palaeophyt.* 389.

Living species: 14-17; mostly American, but in all temperate and tropical regions. U. S., 10-12; E. Sts., 7; So. Sts., 5; Canada, 4; California, 1; Atl. America and Tex., 10.

Fossil species: 3-4; Tertiary; Alaska, Greenland, Spitzbergen (*Heer*); doubtful.

***Sagittaria rigida* PURSH, Fl. Am. 397 (1814).**

S. heterophylla PURSH, Fl. Am. 396 (1814) not Schreb.

Wats. and Coult., Gray's Man. 6 ed. 555; Britt., Fl. N. J. 256; Upham, Fl. Minn. 138; Chap., Fl. S. St. 449; Mac., Fl. Can. II, 78.

North America: St. Lawrence to N. Eng., N. J. and Fla.; W. to Minn. and Mo.

Minn. valley: Throughout; edges of lakes or quiet streams; abundant.

HERB.: *Sheldon* 321, Madison Lake, Blue Earth Co.; *Ballard* 814, Page Lake, Carver Co.; *Sheldon* 705, White Bear Lake; *Ballard* 588, Crystal Lake, Scott Co.; *Taylor* 444, Lake Helena, Waseca Co.; *Bailey* 542, Long Lake; *Herrick* 289, Minnetonka; *Sandberg* 538, Centre City; *Herb. Wickersheim* 117, Ash Lake, Lincoln Co.

***Sagittaria graminea* MICHX. Fl. N. Am. I, 190 (1803).**

S. acutifolia PURSH, Fl. Am. 397 (1814).

S. purshii KUNTH, Enum. III, 160 (1838).

S. stolonifera ENGELM. and GRAY, Pl. Lindh. 26 (1845).

S. simplex. AUCT. AMER.

Wats. and Coult., Gray's Man. 6 ed. 555; Britt., Fl. N. J. 256; Mac., Fl. Can. II, 79; Webb., Fl. Neb. 97; Chap., Fl. So. St. 449; Cov., Fl. Ark. 228.

North America: Cape Breton, N. Br., Ont. to N. Eng., N. J., Fla.; W. to Minn., Neb., Ark. and La.

Minn. valley: Forest district; local or infrequent; edges of ponds and quiet streams.

HERB.: *Ballard* 603, Prior's Lake, Scott Co.; *Ballard* 237, Jordan, Scott Co.; *Berseth* 1, Minneapolis.

***Sagittaria sagittaeifolia* LINN. Spec. 993 (1753).**

S. minor MILL. Dict. (1768).

S. major SCOP. Fl. Carn. II, 239 (1772).

" *S. monoica* GILIB. Fl. Lith. V, 218 (1781).

S. vulgaris GULDENST. Reise Russ. II, 45 (1791).

S. latifolia and *obtusata* WILLD. Spec. IV, 409 (1805).

Vallisneria bulbosa POIR. Enc. Meth. VIII, 321 (1806).

Sagittaria heterophylla SCHREB. Fl. Erl. II, 119 (1811).

S. gracilis, *hastata* and *simplex* PURSH, Fl. Am. II, 396 (1814).

S. variabilis ENGELM. Gray's Man. ed. 1 (1848).

S. longiloba ENGELM. Torr. Mex. Bound. (1858).

S. sagittaeifolia var. *variabilis* MICHELI, D. C. Mon. Phan. III, 69 (1881).

Wats. and Coult., Gray's *Man.* 6 ed. 554; Upham, *Fl. Minn.* 138; Mac., *Fl. Can.* II, 77; Wats., *Fl. Calif.* II. 201; Webb., *Fl. Neb.* 97; Coult., *Fl. Colo.* 361; Chap., *Fl. So. St.* 449; Britt., *Fl. N. J.* 255; Hook., *Fl. Gt. Brit.* 428; Nym., *Fl. Eur.*; Richt., *Pl. Eur.* 20; Herd., *Fl. Eur. Russ.* 124; Engl. Buchenau, *Nat. Pflanz.* II. 1, 231; Mac., *Fl. Can.* II, 368; Wats., *King Exp.* 340; Cov., *Fl. Ark.* 228; Hart., *Fl. Scand.* I. 416.

Europe; Asia to N. W. India.

North America: Atl. to Pac. in Can.; N. to 60° N. lat.; S. to Calif. and N. Nev.; from Rockies E. to N. Eng., N. J. and Fla.

Minn. valley: Throughout in the various forms; marshes, edges of ponds and quiet streams; abundant.

HERB.: *Forma gracilis* (Pursh), *Ballard* 897, St. Bonifacius; *Ballard* 831, Page Lake; *F. obtusa* (Willd.), *Ballard* 607, Prior's Lake; *Ballard* 731, Benton; *F. hastata* (Pursh), *Taylor* 642, Minnesota Lake; *Taylor* 405, Buffalo Lake, Waseca Co.; *Taylor* 22, Elysian; *Sheldon* 1567, Lake Benton; *Ballard* 666, Waconia; *Ballard* 163, Chaska; *F. latifolia* (Willd.), *Sheldon* 921, Sleepy Eye; *F. angustifolia* (Engelm.), *Sheldon* 1073, Springfield; *Ballard* 739, Waconia; *Ballard* 808, Page Lake, Carver Co.; *Ballard* 830, Page Lake; *F. diversifolia*, *Herrick* 288, Minneapolis; also *F. angustifolia*, *Bailey* 151, Vermilion Lake; *Sandberg* 536, Red Wing; *F. latifolia*, *Sandberg* 537, Vasa; *Oestlund* 188, Minnehaha; *F. hastata*, *Bailey* 154, Vermilion Lake; *Herb. Sheld.* 1683, *forma angustifolia* (Engelm.), Minneapolis; *Herb. Moyer* 230, *forma obtusa* (Willd.), Montevideo.

VII. HYDROCHARITACEAE. Frog's - Bit Family.

Endlicher, *Gen. Pl.* 160 (1840); Benth. and Hook. *Gen. Pl.* III, 448 (1883); Ascherson and Gürke, *Engl. and Prantl, Nat. Pflanz.* 2, I, 238 (1889).

Genera: 14; cosmopolitan; 11 in fresh water; 3 in Indian ocean, African coast waters, Red sea, Australian waters and the Pacific.

Species: 60 living; 1-2 extinct?.

ELODEA L. C. RICH. *Mx. Fl. Bor.-Am.* I, 20 (1803).

Udora NUTT. *Gen.* II, 242 (1818).

Apalanthe and **Egeria** PLANCH. *Ann. Nat. Sci.* 3, XI, 75, 79 (1849).

Anacharis BAB. and PLANCH. *Trans. Bot. Soc. Edin.* III, 27 (1852).

Benth. and Hook., *Gen. Pl.* III, 450; Durand, *Ind. Gen. Phan.* 383; Engler and Prantl, *Nat. Pflanz.* 2, I, 250 (Ascherson and Gürke).

Living species: 6; N. and S. America; Mid. and N. Europe (introduced); U. S., 1.

Elodea canadensis RICH. and MICHX. Fl. N. Am. I, 20 (1803).*Serpicula occidentalis* PURSH, Fl. Am. 38 (1814).*Udora canadensis* NUTT. Gen. II, 242 (1818).*Serpicula verticillata* MUILL. Cat. (1818).*Apalanthe schweinitzii* PLANCH. Ann. Sci. Nat. 3, XI, 75 (1839).*Anacharis canadensis* PLANCH. Ann. Mag. and Nat. Hist. 2 ser. I, 86 (1848).*Udora occidentalis* KOCH, Syn. 771 (1843-45).*Anacharis alsinastrum* BAB. Ann. Nat. Hist. 81 (1848).

Wats. and Coult., Gray's Man. 6 ed. 496; Britt., Fl. N. J. 229; Upham, Fl. Minn. 139; Wats., Fl. Calif. II, 129; Chap., Fl. So. St. 450; Mac., Fl. Can. II, 1; Hook., Fl. Gt. Brit. 382; Richt., Pl. Eur. 21; Herd., Fl. Eur. Russ. 124; Engl., Ascherson, Nat. Pflanz. II, 1, 251; Cov., Fl. Ark. 221; Hart., Fl. Scand. I, 403; Webb., Appx. Neb. 22.

Introduced in Gt. Britain, C. Eur. and Russia.

North America: Q., Ont. to Saskatchewan and Assiniboia; S. to Oregon and Mendocino Co., Calif.; S. to N. Eng., N. J. and N. Car.; W. to Minn., Neb., Ark. and Mo.

Minn. valley: Forest district; abundant; rivers, streams and lakes.

HERB.: *Ballard* 605, Prior's Lake, Scott Co.; *Ballard* 822, Page Lake, Carver Co.; *Ballard* 823a, Jordan, Scott Co.; *Taylor* 317, Janesville; *Oestlund* 189, Minnehaha; *Holzinger* 270, Winona Co.; *Holzinger* 271, Winona Lake.

VALLISNERIA LINN. Gen. 741 (1737) Em. Mich.**Physkium** LOUR. Fl. Cochinch. 662 (1790).**Nechamandra** PLANCH. Ann. Sci. Nat. 3, XI, 78 (1849).**?Lagarosiphon** HARV. Hook. Journ. Bot. IV, 230 (1842) part.

Benth. and Hook., Gen. Pl. III, 450, 451; Durand, Ind. Gen. Phan. 383; Engler and Prantl, Nat. Pflanz. 2, I, 251 (Ascherson and Gürke); Schenck, Palaeophyt. 390.

Living species: 2; tropical and subtropical regions, extending into temperate N. and S. America. 1 sp. tropical Asia and Isl. of Socotra (African region); 1 sp. circumdiffused.

Fossil species: Eocene, Aix (*Saporta*) 1 sp.; Jurassic of Siberia, 1 sp.? (*Schenck*)

Vallisneria spiralis LINN. Spec. 1015 (1753).*Physkium natans* LOUR. Cochinch. 662 (1790).*Vallisneria americana* MICHX. Fl. N. Am. II, 220 (1803).*V. jacquinii* SAVI. Oss. 12 (1816).*V. spiralis* var. *americana* TORR. Comp. 365 (1824).*V. jacquiniana* EICHW. Fl. Casp. Cauc. 2 (1831).

Wats. and Coult., Gray's Man. 6 ed. 496; Britt., Fl. N. J. 229; Mac., Fl. Can. II, 1; Chap., Fl. So. St. 450; Upham, Fl. Minn. 139; Nym., Fl. Eur.; Led., Fl. Ross. IV, 46; Richt., Pl. Eur. 21; Herd., Fl. Eur. Russ. 124; Engl., Ascherson and Gürke, Nat. Pflanz. II, 1, 252; Cov., Fl. Ark. 221.

S. Europe, Mid. and S. Russia; India; Australia; Islands of Mediterranean.

North America: N. Br., Q., Ont. to Man.; S. to N. Eng., N. J., Fla.; W. to Minn. and Tex.

Minn. valley: Forest district and W. to Cottonwood valley and Chippewa; rivers, ponds and lakes.

HERB.: *Ballard* 455, Prior's Lake, Scott Co.; *Herrick* 290, Minnetonka; *Oestlund* 190, Minnehaha; *Holzinger* 272, Winona Co.; *Sandberg* 539, 540, "Minnesota."

VIII. GRAMINEAE. Grass Family.

Endlicher, *Gen. Pl.* 77 (1840); Benth. and Hook., *Gen. Pl.* III, 1074 (1883); Hackel in *Engl. and Prantl, Nat. Pflanz.* 2, II, 1 (1887).

Genera: 300–325; cosmopolitan; 3–4 extinct.

Species: 3500–4000; 3100–3200 (B. and H.); 40–50 extinct?

ANDROPOGON LINN. *Gen. ed.* V, 1014 (1754).

Schizachrium NEES, *Agrost. Bras.* 331 (1829).

Heterochloa DESVX. ex Dur. l. c. (1888).

Diectomis H. B. K. *Nov. Gen. et Spec.* I, 193 (1815).

Homoeatherum NEES, Hook. and Arn. *Beech. Bot.* 239 (1841).

Hypogynium NEES, *Agrost. Bras.* 364 (1829).

Anadelphia HACK. *Engl. Jahrb.* VI, 240 (1885).

Arthostachys DESVX. ex Dur. l. c. (1888).

Euklastaxon STEUD. *Syn. Glum.* I, 412 (1855).

? **Agenium** NEES, Lindl. *Introd. Nat. Syst. ed.* 2, 447 (1835).

Sorghum PERS. *Syn.* I, 101 (1805).

Blumenbachia KOEL. *Gram. Gall.* 28 (1802).

Vetiveria THOU. ex Vir. *Journ. Pharm.* I, XIII, 499 (1857).

Anatherum P. BEAUV. *Agrostogr.* 128 (1812).

Mandelorna STEUD. *Syn. Glum.* I, 359 (1855).

Chrysopogon TRIN. *Fund. Agr.* 187 (1820).

Rhaphis LOUR. *Cochinch.* 552 (1790).

Centrophorum TRIN. *Fund. Agr.* (1820).

Holcus R. BR. *Prodr.* 198 (1810) in part.

Dichantium WILLEM. *Herb. Maur. in Ust. Ann. Bot.* XVIII, 11 (1796).

Diplasanthus DESVX. ex Dur. l. c. (1888).

Lepeocercis TRIN. *Fund. Agr.* 203 (1820).

Cymbopogon SPRENG. *Pl. Min. Cog. Pugil.* II, 14 (1815).

Gymnanthelia and **Hyparrhenia** ANDERS. *Schweinf. Beitr. Fl. Aethiop.* 299, 300 (1862?).

Heteropogon PERS. *Syn.* II, 533 (1805).

Benth. and Hook., *Gen. Pl.* III, 1123–1135; Durand, *Ind. Gen. Phan.* 464; Engler and Prantl, *Nat. Pflanz.* 2, II, 26 (Hackel).

Living species: 200 ±; warmer regions; N. America, Asia and temperate Europe. Europe, 8–9; N. America, 24;

So. Sts., 20; Canada, 3-4; E. Sts., 10; Rocky Mts., 5; Pl. Wheel., 6.

Andropogon nutans LINN. Spec. 1045 (1753).

A. arenaceus MICHX. Fl. N. Am. I, 58 (1803).

Sorghum nutans GRAY. Man. ed. I, 617 (1848).

Chrysopogon nutans B. and H. Gen. Pl. III, 1135 (1883).

Wats. and Coult., Gray's Man. 6 ed. 638; Mac., Fl. Can. II, 185; Webb., Fl. Neb. 105; Coult., Fl. Colo. 406; Chap., Fl. So. St. 583; Vas., Ag. Grasses U. S. 36; Upham, Fl. Minn. 173; Roth., Wheel. Exp. 296; Cov., Fl. Ark. 234; Vas., Mon. 9.

North America: Ont. to Man.; S. to N. Y., N. J. and Fla.; W. to Minn., Neb., Kan., Mo., Ark. and S. Colo.

Minn. valley: Throughout; principally prairie district; dry and high places.

HERB.: *Sheldon* 1595, Lake Benton; *Taylor* 1064, Alexandria; *Sheldon*, 1289, Lake Benton; *Sheldon* 1652, Minneapolis; *MacM. and Sheld.* 17, Brainerd; *Sandberg* 606, Red Wing; *Foote* 12, Worthington.

Andropogon provincialis LAM. Enc. Meth. I, 376 (1783).

A. villosus var. *B.* LAM. Fl. Fr. III, 634 (1778).

A. gerardi VITM. Summ. Pl. VI, 16 (1792).

A. furcatus MUHL. Willd. Spec. IV, 919 (1805).

Wats. and Coult., Gray's Man. 6 ed. 637; Mac., Fl. Can. II, 184; Britt., Fl. N. J. 284; Webb., Fl. Neb. 105; Coult., Fl. Colo. 405; Upham, Fl. Minn. 173; Chap., Fl. So. St. 581; Vas., Ag. Grasses U. S. 35; Richt., Pl. Eur. I, 23; Cov., Fl. Ark. 234; Vas., Mon. 12.

Southern France.

North America: Ont.; L. of Woods, Man.; S. to N. J. and Fla.; W. to Minn., Dak., Neb., Colo., Ark. and Tex.

Minn. valley: Throughout; especially in prairie district; dry and high places.

HERB.: *Taylor* 1028, Glenwood; *Sheldon* 1172, New Ulm; *Taylor* 1071, Alexandria; *Sheldon* 1130, Springfield; *Sheldon* 1338, Lake Benton; *Sandberg* 603, Goodhue Co.; *Sandberg* 604, Red Wing; *Foote* 10, Worthington; *Oestlund* 349, Minneapolis; 350, Minneapolis.

Andropogon scoparius MICHX. Fl. N. Am. I, 57 (1803).

A. dissitiflorus MICHX. Fl. N. Am. I, 57 (1803).

A. purpurascens WILLD. Spec. IV, 913 (1805).

Pallinia scoparia SPRENG. Syst. II, 832 (1825).

Wats. and Coult., Gray's Man. 6 ed. 637; Britt., Fl. N. J. 284; Mac., Fl. Can. II, 185; Webb., Fl. Neb. 105; Upham, Fl. Minn. 173; Coult., Fl. Colo. 405; Chap., Fl. So. St. 581; Vas., Ag. Grasses U. S. 35; Roth., Wheel. Exp. 296; Cov., Fl. Ark. 234; Vas., Mon. 10.

North America: N. Br., Q., Ont. to Man. and Sas-

katchewan; S. to N. Eng.. N. J. and Fla.; W. to Minn., Dak., Neb., Kan., Mo., Ark. and S. Colo.

Minn. valley: Throughout; principally in prairie district; high or dry places.

HERB.: *Sheldon* 1318, Lake Benton; *Sheldon* 1378, Verdi, Lincoln Co.; *MacM. and Sheld.* 13, Brainerd; *Sandberg* 605, Red Wing; *Foote* 11, Worthington.

PANICUM LINN. Gen. 47 (1737).

Thalassium SPRENG. Syst. Cur. Post. 22, 30 (1827).

Digitaria RICH. in Pers. Syn. I, 84 (1805).

Syntherisma WALT. Fl. Carol. 76 (1788).

Trichachne NEES, Agrost. Bras. 85 (1829).

Acicarpa RADDI, Agrost. Bras. 31 (1823).

Urochloa KUNTH, Rev. Gram. I, 31 (1835).

Coridochloa NEES, Edin. Phil. Journ. XV, 381 (1831?).

Eriachne PHILIPPI, Sert. Mend. Alt. 49 (1860?).

Holosetum, Mesosetum STEUD. Syn. Glum. I, 118 (1855).

Bluffia, Rhynchelythrum NEES, Fl. Afr. Austr. Gram. 61, 64 (1841).

Thrasya H. B. K. Nov. Gen. et Spec. I, 120 (1815).

Tylothrasya DOELL. Mart. Fl. Bras. II, 2, 295 (1833).

? **Dimorphostachys** FOURN. Compt. Rend. LXXX, 441 (1875).

Paractaenium, Urochloa, Echinochloa, Hymenachne BEAUV. Agrostogr. 47, 48, 53 (1812).

Streptostachys DESVX. Bull. Philom. II, 190 (1810).

Otachyrium NEES, Agrost. Bras. 273 (1829).

Coleataenia GRISEB. Symb. Arg. 308 (1875).

Tricholaena SCHRAD. R. and S. Syst. II, Mant. 163 (1824).

? **Gramerium** DESVX. ex Dur. l. c. (1888).

? **Alloteropsis** PRESL, ex Dur. l. c. (1888).

Benth. and Hook., *Gen. Pl.* III, 1100; Durand, *Ind. Gen. Phan.* 466; Engler and Prantl, *Nat. Pflanz.* 2, II, 35, 36 (Hackel); Schenck, *Palaeophyt.* 384.

Living species: 310 \pm ; temperate and warmer regions; Europe, 13; Russia, 10–12; N. America, 67; So. Sts., 48; E. Sts., 22; California, 15; Rocky Mts., 5; Canada, 15; Texas, 41; Pl. Wheel., 5; Pl. King, 3.

Fossil species: ? Tertiary of Switzerland (*Schenck*).

Panicum crus-galli LINN. var. hispidum (MUHL.) TORR. Fl. N. Y. II, 424 (1843).

P. muriatum MICHX. Fl. N. Am. I, 47 (1803).

P. walteri PURSH, Fl. Am. 66 (1814).

P. hispidum MUHL. Gram. 107 (1817).

Oplismenus muricatus KUNTH, Enum. I, 143 (1833).

Wats. and Coult., *Gray's Man.*, 6 ed. 634; Britt., Fl. N. J. 282; Mac., Fl. Can. II, 177; Webb., Fl. Neb. 106; Upham, Fl. Minn. 173; Roth., Wheel. Exp. 295; Wats., King Exp. 394; Cov., Fl. Ark. 232; Vas., Mon. 37.

North America: Ont., N. Y. and N. J. to Minn., Neb. and Ark.

Minn. valley: Reported from S. E. and S. W. edges; doubtfully indigenous; boggy places or drier soil.

HERB.: *Sandberg 600*, Red Wing.

***Panicum dichotomum* LINN.** Spec. 58 (1753).

P. pubescens, nitidum and *laxiflorum* LAM. Enc. Meth. IV, 749 (1797).

P. barbulatum and *ramulosum* MICHX. Fl. N. Am. I, 46 (1803).

? *P. microcarpon* MUHL. Gram. 112 (1817).

Wats. and Coult., Gray's Man., 6 ed. 633; Britt., Fl. N. J. 280; Chap., Fl. So. St. 576; Mac., Fl. Can. II, 178; Webb., Fl. Neb. 106; Coult., Fl. Colo. 404; Wats., Fl. Calif. II, 259; Upham, Fl. Minn. 172; Wats., King Exp. 394; Cov., Fl. Ark. 232; Vas., Mon. 30.

North America: Newf., N. S., Q., Ont. to Owen Sound, Ste. Marie and Thunder Bay; S. to N. Y., N. J., Fla.; W. to Minn., Neb., Ark., Colo., Calif. and S. to N. Mex.

Minn. valley: Forest district and probably W; dry fields and along embankments.

HERB.: *Ballard 8*, Chaska; *Sheldon 1100*, Springfield; *Ballard 278*, Jordan, Scott Co.; *Ballard 520*, Prior's Lake, Scott Co.; *Ballard 315*, Belle Plaine; *Ballard 544*, Spring Lake, Scott Co.; *Ballard 637*, Chaska; *Sheldon 1216*, New Ulm; *Sheldon 515*, Waseca [*var. pubescens* (Lam.)]; *Oestlund 346*, Minneapolis; *Oestlund 347*, Minneapolis [*var. pubescens* (Lam.)]; *Herb. Sheld. 1709, 1798*, Minneapolis.

***Panicum depauperatum* MUHL.** Gram. 112 (1817).

? *P. strictum* PURSH, Fl. Am. 69 (1814).

P. rectum R. and S. Syst. II, 457 (1817).

P. involutum TORR. Fl. U. S. I, 144 (1824).

Wats. and Coult., Gray's Man., 6 ed. 633; Britt., Fl. N. J. 279; Mac., Fl. Can. II, 177; Webb., Fl. Neb. 106; Upham, Fl. Minn. 173; Chap., Fl. So. St. 576; Cov., Fl. Ark. 232; Vas., Mon. 29.

North America: Newf., N. S., Q., Ont. to Saskatchewan; S. to N. Eng., N. Y., N. J., N. Car.; W. to Minn., Neb. and Ark.

Minn. valley: Forest district; dry woods; hillsides, along embankments and shores of lakes.

HERB.: *Leiberg 104*, Blue Earth Co.; ? *Sandberg 599*, Cannon Falls; *Herb. Sheld. 1797*, Minneapolis.

***Panicum scoparium* LAM.** Enc. Meth. IV (1797).

P. pauciflorum ELL. Sk. I. (1821).

Wats. and Coult., Gray's Man., 6 ed. 632; Britt., Fl. N. J. 280; Webb., Fl. Neb. 106; Mac., Fl. Can. II, 180; Coult., Fl. Colo. 404; Wats., Fl. Calif. 259; Upham, Fl. Minn. 172; Chap., Fl. So. St. 575; Cov., Fl. Ark. 233; Vas., Mon. 31.

North America: Ont., N. Y., N. J. to N. Car. and Fla.; W. to Vancouver; S. to Calif., Oregon, Colo., Neb., Minn.

Minn. valley: Forest district; rare or infrequent; wet fields and edges of thickets.

HERB.: *Leiberg 103*, Blue Earth Co.

***Panicum latifolium* LINN.** Spec. 59 (1753).

P. walteri POIR. Enc. Suppl. IV, 282 (1816).

P. clandestinum HOOK. Fl. Bor.-Am. II, 235 (1840).

Wats. and Coult., Gray's Man., 6 ed. 632; Britt., Fl. N. J. 280; Mac., Fl. Can. II, 179; Chap., Fl. So. St. 575; Cov., Fl. Ark. 232; Vas., Mon. 33.

North America: Q., Ont., N. Y., N. J. and Fla.; W. to Minn., Mo. and Ark.

Minn. valley: Forest district; infrequent; thickets and damp copses or woodland.

HERB.: *Sheldon 620*, Wilton, Waseca Co.; *Ballard 487*, Prior's Lake, Scott Co.; *Oestlund 345*, Hennepin Co.

***Panicum xanthophyllum* GRAY,** Gram. I, 28 (1835).

Wats. and Coult., Gray's Man., 6 ed. 631; Upham, Fl. Minn. 172; Mac., Fl. Can. II, 180; Vas., Mon. 29.

North America: Ont. to Man., Saskatchewan and Assiniboia; S. to Maine and Penn.; W. to Minn., Wisc., Iowa and Dak.

Minn. valley: Forest district; rare; sandy soil along embankments or beside ponds or streams.

HERB.: *Sheldon 555*, Waseca.

***Panicum virgatum* LINN.** Spec. 59 (1753).

Wats. and Coult., Gray's Man., 6 ed. 631; Britt., Fl. N. J. 282; Upham, Fl. Minn. 172; Mac., Fl. Can. II, 180; Webb., Fl. Neb. 106; Coult., Fl. Colo. 403; Chap., Fl. So. St. 573; Vas., Ag. Grasses U. S. 28; Cov., Fl. Ark. 223; Vas., Mon. 36.

North America: Ont. to L. Huron region, Saskatchewan and Assiniboia; S. to N. Eng., N. J. and Fla.; W. to Minn., Neb., Colo., Mo. and Ark.

Minn. valley: Throughout; especially in prairie district; sandy soil and embankments.

HERB.: *Sheldon, 1206*, New Ulm; *Oestlund 341*, Minneapolis; *342*, Minneapolis; *Foote 9*, Worthington; *Sandberg 598*, Red Wing.

***Panicum agrostoides* MUHL.** Gram. 119 (1817).

P. multiflorum POIR. Suppl. Enc. IV, 282 (1817).

P. elongatum PURSH, Fl. Am. I, 69 (1814).

Wats. and Coult., Gray's Man. 6 ed. 631; Mac., Fl. Can. II, 176; Britt., Fl. N. J. 281; Vas., Ag. Grasses U. S. 28; Webb., Fl. Neb. 106; Wats., Fl. Calif. II, 258; Upham, Fl. Minn. 172; Cov., Fl. Ark. 232; Vas., Mon. 35.

North America: Mass. and N. J. to Minn. and Vancouver; S. to Gulf of Mexico and to Sacramento, Calif.

Minn. valley: Reported from N. E. districts; rare; damp fields and shores of lakes or along streams.

***Panicum nudum* WALT.** Fl. Car. (1788).

P. dichotomiflorum MICHX. Fl. N. Am. (1803).

P. divergens MUHL. Gram. (1817).

P. autumnale BOSC. Mem. (1822).

P. fragile KUNTH, Enum. (1833).

Wats. and Coult., Gray's Man. 6 ed. 630; Upham, Fl. Minn. 172; Vas., Mon. 33.

North America: Ill. to S. Minn., Mo. and Tex?

Minn. valley: Reported from S. central region; rare or doubtful; hillsides or plains; sandy soil.

***Panicum capillare* LINN.** Spec. 58 (1753).

Milium capillare MOENCH, Meth. 203 (1794).

? *Panicum strigosum* ELL. Sk. I, 126 (1821).

Wats. and Coult., Gray's Man. 6 ed. 630; Britt., Fl. N. J. 281; Mac., Fl. Can. II, 177; Wats., Fl. Calif. II, 258; Coult., Fl. Colo. 403; Webb., Fl. Neb. 106; Chap., Fl. So. St. 574; Upham, Fl. Minn. 172; Richt., Pl. Eur. I, 26; Led., Fl. Ross. IV, 470; Wats., King Exp. 394; Cov., Fl. Ark. 232; Vas., Mon. 33.

Introduced in S. Europe and Russia.

North America: N. S., N. Br., Q., Ont. to Saskatchewan, Man., Brit. Col. and Vancouver; S. to N. Eng., N. J. and Fla.; W. to Pac. coast and S. Calif.

Minn. valley: Throughout; abundant; dry fields and along embankments.

HERB.: *Taylor 1155*, Glenwood; *Sheldon 956*, Redwood Falls; *Sheldon 1460*, Pipestone; *Foote 8*, Worthington; *Oestlund 340*, Hennepin Co.; *Sandberg 597*, Red Wing; *Sheldon 1529*, Lake Benton; *Herb. Sheld. 1671*, Minneapolis.

CENCHRUS LINN. Gen. Corr. n. 989 (1737), p. p.

Benth. and Hook., *Gen. Pl.* III. 1105; Durand, *Ind. Gen. Phan.* 467; Engler and Prantl, *Nat. Pflanz.* 2, II. 36 (Hackel).

Living species: 12; tropical and subtropical regions and in temperate N. and S. America. N. America, 4, So. Sts., 4; E. Sts., 1; California, 1; Rocky Mts., 1; Pl. King., 1.

***Cenchrus tribuloides* LINN.** Spec. ed. II. 1488 (1762).

C. carolinianus WALT. Fl. Car. 79 (1788).

C. echinatus MUHL. Gram. 52 (1817).

Wats. and Coult., Gray's Man. 6 ed. 634; Britt., Fl. N. J. 282; Mac., Fl. Can. II. 181; Webb., Fl. Neb. 106; Wats., Fl. Calif. I. 261; Coult., Fl. Colo. 404; Chap., Fl. So. Sts. 579; Upham, Fl. Minn. 173; Engl. Hackel, *Nat.*

Pflanz. II. 2, 36; Gris., Fl. W. I.; Wats., King Exp. 394; Cov., Fl. Ark. 232; Vas., Mon. 39.

Africa? Jamaica, Antigua and East Indies.

North America: N. Eng. to Fla.; W. to Calif. and Oregon; Ontario, introduced (?).

Minn. valley: Throughout; sandy or waste places along streams and roadsides or embankments.

HERB.: *Sheldon* 1190, New Ulm; *Leiberg* 105, Minnesota valley; *Kassube* 275, Minneapolis; *Sandberg* 601, Goodhue Co.; *Oestlund* 348, Minneapolis; *Holzinger* 295, Winona Co.; *Herb. Sheld.* 1706, Minneapolis.

ZIZANIA LINN. Gen. ed., II. 863 (1742) em.

Hydropyrum LINK. Hort. Berol. I. 252 (1827).

Melinum LINK. Handb. Nutz. Gew. I. 96 (1829)

Zizaniopsis DOELL. and ASCH. Mart. Fl. Bras. II. 2, 12 (1833?).

Benth. and Hook., *Gen. Pl.* III. 1115; Durand, *Ind. Gen. Phan.* 468; Engler and Prantl, *Nat. Pflanz.* 2, II. 40 (Hackel).

Living species: 2; N. and S. America; N. E. Asia, E. U. S. and Can, 1; S. U. S. and Brazil, 1.

Zizania aquatica LINN. Spec. 991 (1753).

Z. palustris LINN. Mant. II. 295 (1771).

Z. clavulosa MICHX. Fl. N. Am. I. 75 (1803).

Hydropyrum esculentum LINK, Hort. Berol. I. 252 (1827).

Wats. and Coult., Gray's *Man.* 6 ed. 635; Britt., Fl. N. J. 283; Upham, Fl. Minn. 159; Chap., Fl. So. St. 549; Webb., Fl. Neb. 105; Mac., Fl. Can. II, 183; Vas. Ag. Grasses U. S. 33; Engl. Hackel, *Nat. Pflanz.* II. 2.40; Cov., Fl. Ark, 233; Vas., Mon. 41.

Siberia and Japan.

North America: Newf. N. S., N. Br., Q., Ont., Man.; S. to Penn. and Fla.; W. to Minn., Neb., Mo., Ark. and Tex.

Minn. valley: Throughout; somewhat local; shallow waters; edges of lakes and narrows between ponds.

HERB.: *Taylor* 222, Janesville; *Taylor* 1019, Glenwood; *Sandberg* 554, Red Wing.

HOMALOCENCHRUS MIEG. ex. Hall, Stirp. Helv. II. 201 (1768).

Leersia SWARTZ, Nov. Gen. et. Spec. 21 (1788).

Ehrhartia WIGG. Prim. Holst. 63 (1780).

Asprella SCHREB. Gen. Pl. 45 (1789).

Blepharochloa ENDL. Gen. Pl. 1352 (1840).

Benth. and Hook., *Gen. Pl.* III. 1117; Durand, *Ind. Gen. Phan.* 468; Engler and Prantl. *Nat. Pflanz.* 2, II. 41 (Hackel); O. Kuntze, *Rev. Gen.* II. 777

Living species: 5; America, 3 endem.; Old World, temperate regions, 1; tropical regions, 1; U. S., 4; Atlantic States, 3; Tex., 1.

Homalocenchrus oryzoides (LINN.) POLL. Fl. Palat., I. 52 (1776).

Phalaris oryzoides LINN. Spec. 55 (1753).

Ehrhartia clandestina WIGG. Fl. Holst. 695 (1780).

Asprella oryzoides LAM. Ill. I. 167 (1791).

Leersia oryzoides Sw. Fl. Ind. Occ. I. 132 (1797).

Oryza clandestina A. BR. Asch. Fl. Brand. 799 (1864).

Wats. and Coult., Gray's Man. 6 ed. 635; Britt., Fl. N. J. 284; Webb., Fl. Neb. 105; Upham, Fl. Minn. 159; Wats., Fl. Calif. II. 262; Mac., Fl. Can. II. 184; Vas. Ag. Grasses U. S. 34; Chap., Fl. So. St. 548; Engl., Häckel, Nat. Pflanz. II. 2, 41; Richt., Pl. Eur. I. 28; Nym., Fl. Eur.; Hook., Fl. Gt. Brit. 471; Led., Fl. Ross. IV. 466; Cov., Fl. Ark. 233; Hart., Fl. Scand. I. 571; Vas., Mon. 41.

Northern, Central and Southern Europe; Temperate Asia; N. Africa.

North America: Newf., N. S., N. Br., Q., Ont. to Saskatchewan; Oregon to Calif.; Atl. Region to Fla. and W. to Missouri river valley.

Minn. valley: Throughout, principally in forest district; sloughs and marshes.

HERB.: Taylor 1159, Glenwood; Oestlund 221-222, Hennepin Co.; Sandberg 557, Red Wing.

Homalocenchrus virginicus (WILLD.) BRITT. Fl. N. J. 285 (1890).

Leersia virginica WILLD. Spec. I. 325 (1797).

Asprella virginica R. and S. Syst. II. 266 (1817).

Wats. and Coult., Gray's Man. 6 ed. 635; Upham, Fl. Minn. 159; Webb., Fl. Neb. 105; Mac., Fl. Can. II. 184; Chap., Fl. So. St. 548; Vas. Ag. Grasses U. S. 34; Cov., Fl. Ark. 233; Vas., Mon. 41.

North America: Newf. to Maine, N. Y., N. J., Penn. and Fla.; W. to Ont., Ott., Minn., Neb., Ark., La. and Tex.

Minn. valley: Forest district; rare or infrequent; low and marshy woodland.

HERB.: Oestlund 220, Hennepin Co.; Sandberg 556, Goodhue Co.

PHALARIS LINN. Gen. 38 (1737).

Digraphis TRIN. Fund. Agr. 127 (1820).

Baldingera GAERTN. Mey. et. Schreb., Fl. Wett. (1799).

Typhodes MOENCH, Meth. 201 (1794).

Benth. and Hook., Gen. Pl. III. 1138; Durand, Ind. Gen. Phan. 468; Engler and Prantl, Nat. Pflanz. 2, II. 43 (Häckel).

Living species: 10; Europe; Mediterranean region; Canaries; extratropical America. Principally in S. Europe; Europe, 9; Russia, 3; N. America, 5-6; Pac. America, 3; Atl. America, 3; of which 1 is introduced.

Phalaris arundinacea LINN. Spec. 55 (1753).

Calamagrostis variegata WITH. Arr. Brit. Pl. 124 (1776).

Typho des arundinacea MOENCH, Meth. 202 (1794).

Arundo colorata WILLD. Spec. I. 457 (1797).

Baldingera colorata GAERTN. Fl. Wett. 99 (1799).

Calamagrostis colorata DC. Fl. Fr. III. 26 (1805).

Digraphis arundinacea TRIN. Fund. Agr. 130 (1820).

Baldingera arundinacea DUM. Agr. Belg. 130 (1823).

Phalaris americana TORR. Fl. U. S. I. 100 (1824).

Wats. and Coult., Gray's Man. 6 ed. 639; Britt., Fl. N. J. 285; Mac., Fl. Can. II. 185; Webb., Fl. Neb. 105; Wats., Fl. Calif. II. 265; Coult., Fl. Colo. 406; Vas., Ag. Grasses U. S. 38; Upham, Fl. Minn. 171; Engl. Hackel, Nat. Pflanz. II. 2, 43; Led., Fl. Ross IV. 454; Richt., Pl. Eur. I. 30; Hook., Fl. Gt. Brit. 472; Miyabe, Fl. Kur. 269; Wats., King Exp. 393; Hart., Fl. Scand. I, 528; Vas., Mon. 42.

Mid. and N. Europe; Asia to Kurile Isls.

North America: N. S., N. Br., Q., Ont. to Hudson Bay, Saskatchewan, Man., Brit. Col., Vancouver; S. to N. Eng., N. J., Penn. and Va; W. to Minn., Neb., Colo., Calif. and Washington.

Minn. valley: Throughout; not infrequent; marshy meadows and wet ground.

HERB.: *Sheldon* 456, Duck Lake, Blue Earth Co.; *Sheldon* 1519, Lake Benton; *Ballard* 245, Jordan, Scott Co.; *Bailey* 446, Mud Lake.

HIEROCHLOE GMEL. Fl. Sib. I. 100 (1747).

Savastana SCHRANK. Bair. Fl. I. 100, 337 (1789).

Disarrenum LABILL. Pl. Nov. Holl, II. 82 (1806).

Torresia R. and P. Prodr. Peruv. 125 (1794).

Ataxia R. BR. Chlo r. Melv. 242 (1824).

Benth. and Hook., *Gen. Pi.* III. 1139; Durand, *Ind. Gen. Phan.* 469; Engler and Prantl, *Nat. Pflanz* 2, II. 44 (Hackel).

Living species: 13; cosmopolitan; in tropical mts. Europe, 5; Russia, 5; N. America, 4; Calif. and Oregon, 1; Atl. region, 2; Melville's Isl., 1.

Hierochloe odorata (LINN.) WAHL. var. **fragrans** (WILLD.) Richt., Pl. Eur. I. 31 (1890).

Holcus fragrans WILLD. Spec. IV. 936 (1805)

Hierochloa fragrans R. and S. Syst. II. 513 (1817).

H. borealis and *odorata*. AUCT. AMER.

Wats. and Coult., Gray's Man. 6 ed. 639; Britt., Fl. N. J. 285; Wats., Fl. Calif. II. 266; Coult., Fl. Colo. 406; Mac., Fl. Can. II. 187; Upham, Fl.

Minn. 171; Engl. Hackel, *Nat. Pflanz.* II. 2, 44; Hook., *Fl. Gt. Brit.* 473? Trautv., *Fl. Sib.* 139? Miyabe, *Fl. Kur.* 269? Wats., *King Exp.* 393; Roth., *Wheel. Exp.* 294; Vas., *Mon.*, 43; Rothr., *Alaska* 458.

N. Europe and possibly N. Asia and Kurile Isls.

North America: Labrador and Newf to Hudson Bay and Alaska; S. to N. Eng., N. J.; W. to Gt. Lake region and Oregon to Calif. and Washington.

Minn. valley: Throughout; common; damp fields and marshy meadows.

HERB.: *Sheldon* 175, Eagle Lake, Blue Earth Co.; *Menzel* 7, Pipestone City; *Gedge* 17, Detroit, Becker Co.; *Bailey* 541, Long Lake; *Sandberg* 596, Goodhue Co.

ARISTIDA LINN. Gen. ed. V. 88 (1754).

Chaetaria, Curtopogon, Arthratherum P.-BEAUV. *Agrostogr.* 30, 32. (1812).

Streptachne HBK. *Nov. Gen. et Spec.* I. 124 (1815).

Ortachne NEES, *Seem. Bot. Her.* 225 (1857).

Stipagrostis NEES, *Linn. VII.* 290 (1833).

Schistachne FIG. ET NOTAR. *Mem. Ac. Tur.* 2, XII. 252 ()

Benth. and Hook., *Gen. Pl.* III. 1140; Durand, *Ind. Gen. Phan.* 469; Engler and Prantl, *Nat. Pflanz.* 2, II. 45 (Hackel).

Living species: 100; warmer regions; few in temperate Eur. and Asia; abundant in N. America. Europe, 2; N. America, 29-30; So. Sts., 17; E. Sts., 10; Canada, 3-4; Tex., N. Mex. and Arizona region, 21.

Aristida purpurea NUTT. *Trans. Am. Phil. Soc.* v. (1837).

Wats. and Coult., *Gray's Man.* 6 ed. 640; Upham, *Fl. Minn.* 164; Vas., *Ag. Grasses U. S.* 41; Coult., *Fl. Colo.* 407; Webb., *Fl. Neb.* 105; Mac., *Fl. Can.* II. 190; Roth., *Wheel. Exp.* 286; Wats., *King Exp.* 381; Cov., *Fl. Ark.* 234.

North America: Brit. Col. and Colo. to Tex.; W. to Great Basin region; E. to Dak., Minn., Iowa, Neb., Mo. and Ark.

Minn. valley; S., Central and W. districts; sandy or dry localities.

HERB.: *Sheldon* 1379, Lake Benton; *Leiberg* 90, Blue Earth Co.; *Leiberg* 91, Rock Co.

Aristida basiramea ENGELM. *Bot. Gaz.* IX. 76 (1884).

Wats. and Coult., *Gray's Man.* 6 ed. 640; Webb., *Fl. Neb.* 105; Upham, *Fl. Minn.* 163; Mac., *Fl. Can.* II. 190; Coult., *Fl. Colo.* 407; Vas., *Mon.* 44.

North America: Man. to Kan., Colo., Neb., Iowa and Ill.

Minn. valley: N. E. and S. W. districts; dry, sandy localities; local or rare.

HERB.: *Upham* 3, Minneapolis; *Upham* 4, Minneapolis.

STIPA LINN. Gen. ed. V. 84 (1754).

Macrochloa KUNTH. Rev. Gram. I. 58 (1835).

Aristella BERTOL. Fl. It. I. 690 (1833).

Streptachne R. BR. Prodr. 174 (1810).

Orthoraphium NEES, Proc. Linn. Soc. I, 94 (1841).

Jarava R. and P. Prodr. Peruv. 2 (1794).

Lasiagrostis LINK, Hort. Berol. I. 99 (1827).

Achnatherum PAL.-BEAUV. Agrostogr. 19 (1812).

Ptilagrostis GRISEB. in Led., Fl. Ross. IV. 447 (1853).

Benth. and Hook., *Gen. Pl.* III. 1141; Durand, *Ind. Gen. Phan.* 469; Engler and Prantl, *Nat. Pflanz.* 2, II. 46 (Hackel).

Living species: 100; tropical and temperate regions; Europe, 12; Russia, 9-10; N. America, 23; Canada, 6; E. Sts., 4; So. Sts. 1; California to Montana and Colo., 15-16; Tex. and N. Mex. region, 7-8.

Stipa spartea TRIN. Act. Petr. I. 440 (1830).

Wats. and Coult., Gray's Man. 6 ed. 641; Upham, Fl. Minn. 163; Webb., Fl. Neb. 104; Coult., Fl. Colo. 408; Mac., Fl. Can. II. 191; Vas. Ag. Grasses U. S. 42; Engl. Hackel, *Nat. Pflanz.* II. 2, 46; Wats., King Exp. 379; Roth., Wheel. Exp. 285; Vas., Mon. 53.

North America: Prairie region of Can. from Portage la Prairie to Rockies; S. to Colo. and Upper Missouri region; E. to Neb., Iowa, Kan., Minn., Ill. and Mich.

Minn. valley: Throughout; principally in prairie district; dry or high prairies or moister land.

HERB.: *Ballard* 173, Shakopee; *Sheldon* 1383, Lake Benton; *Sheldon* 607, Wilton, Waseca Co.; *Sheldon* 746, Sleepy Eye; *Kassube* 272, Minneapolis; *Herrick* 340, Minneapolis; *Sandberg* 564, Chisago Co.

ORYZOPSIS MICHX. Fl. N. Am. I, 51 (1803).

Dilepyrum RAF. ex. Endl. Gen. 87 (1836).

Urachne TRIN. Fund. Agr. 109 (1820).

Piptatherum BEAUV. Agrostogr. 17 (1812).

Caryochloa SPRENG. Syst. Cur. Post. 22, 30 (1827).

Piptochaetium PRESL, Rel. Haenk. I. 222 (1830).

Nassella E. DESVX. in Gay Fl. Chile, VI. 263 (1845).

Eriocoma NUTT. Gen. I. 40 (1818).

Fendleria STEUD. Syn. Glum. I. 419 (1855).

Schousbaea NICOTR. ex. Dur. l. c. (1888).

Benth. and Hook., *Gen. Pl.* III. 1142; Durand, *Ind. Gen. Phan.* 469; Engler and Prantl, *Nat. Pflanz.* 2, II. 46, 47 (Hackel).

Living species: 28; temperate regions N. and S., especially S. America. Europe, 5; N. America, 8; Canada, 4; E. Sts., 4; California and Pac. Coast, 6.

Oryzopsis juncea (MICHX.) B. S. P. Cat. N. Y. (1888).*Stipa juncea* MICHX. Fl. N. Am. I. 54 (1803).*S. canadensis* POIR. Enc. Meth. VII. 452 (1806).*Milium pungens* TORR. Fl. U. S. I. 78 (1824).*Urachne brevicaudata* TRIN. Gram. Pan. 27 (1826).*Oryzopsis parviflora* HOOK. Fl. Bor. Am. II. 236 (1840).*O. canadensis* TORR. Fl. N. Y. II. 433 (1843).

Wats. and Coult., Gray's Man. 6 ed. 642; Mac., Fl. Can. II. 192; Britt., Fl. N. J. 286; Upham, Fl. Minn. 162; Vas., Mon. 55.

North America: St. Lawrence, Q., Ont., to Port Arthur and Saskatchewan, Brit. Col. and Rocky Mts.; S. to W. N. Eng., N. J.; W. to Penn., Wis. and Minn.

Minn. valley: Reported from S. E. edge; rocky or gravelly hillsides.

Oryzopsis asperifolia MICHX. Fl. N. Am. I. 51 (1803).*Urachne leucosperma* LINK, Hort. Berol. I, 94 (1828).*U. asperifolia* TRIN. Diss. I, 174 (1828).

Wats. and Coult., Gray's Man. 6 ed. 642; Britt., Fl. N. J. 286; Mac., Fl. Can. II. 192; Upham, Fl. Minn. 162; Vas., Mon. 55.

North America: Newf., N. Br., Q., Ont. to Man., Brit. Col., Rocky Mts.; S. to N. Eng., N. J., and Penn.; W. to Minn., Dak. and Mo.

Minn. valley: N. E. and N. districts, woods, hillsides and shaded banks; local or rare.

HERB.: *Sheldon* 1926, Minneapolis.

Oryzopsis melanocarpa MUHL. Gram. 79 (1817).*Milium racemosum* SM. Rees, Cyc. (1819?).*Piptatherum nigrum* TORR. Fl. U. S. I. 79 (1824).*Urachne racemosa* TRIN. Diss. I, 174 (1828).*?Oryzopsis asperifolia* KUNTH, Enum. I, 176 (1833, *in part*).

Wats. and Coult., Gray's Man. 6 ed. 642; Britt., Fl. N. J. 286; Mac., Fl. Can. II, 193; Upham, Fl. Minn. 162; Vas., Mon. 55.

North America: Ont. to N. Eng., N. J. and Penn.; W. to Minn. and Mo.

Minn. valley: Forest and N. W. districts; dry or rocky woods.

HERB.: *Taylor* 949, Glenwood; *Herrick* 339, Minneapolis.

MUHLENBERGIA SCHREB. Gen. Pl. 44 (1789).**Vaseya** THURB. Proc. Phil. Acad. 79 (1863).**Podosaemum** DESVX. Bull. Philom. II, 188 (1813).**Trichochloa** BEAUV. Agrostogr. 29 (1812).**Bealia** SCRIBN. ex. Durand, Ind. Gen. Phan. 469 (1888).**Calycodone** NUTT. Jour. Acad. Phil. I, 166 (1817).**Clomena** and **Tosagris** BEAUV. Agrostogr. 28, 29 (1812).

Benth. and Hook., *Gen. Pl.* III, 1143; Durand, *Ind. Gen. Phan.* 469; Engler and Prantl, *Nat. Pflanz.* 2, II, 47 (Hackel).

Living species: 60; N. America and Andes of S. America; a few in Japan and the Himalayas. N. America, 37; Canada, 5-6; So. Sts., 7; E. Sts., 8; California, 4-5; Texas, N. Mex. and Arizona region, 31.

Muhlenbergia diffusa SCHREB. Gram; II, t. 51 (1772).

Dilepyrum minutiflorum MICHX. Fl. Am. I, 40 (1803).

Wats. and Coult., Gray's Man. 6 ed. 644; Vas., Mon. Grasses 68; Britt., Fl. N. J. 287; Mac., Fl. Can. II, 194; Webb., Fl. Neb. 104; Vas., Agr. Grasses U. S. 41.

North America: N. Eng., Ont. and N. Y. to Mich., Minn., Iowa and Neb.; S. to Tex.

Minn. valley: S. district; dry hills and woods or banks of streams.

HERB.: *Leiberg* 107, Blue Earth Co.

Muhlenbergia tenuiflora (WILLD.) B. S. P. Cat. N. Y. (1888).

Agrostis tenuiflora WILLD. Spec. I, 364 (1799).

Cinna tenuiflora LINK, Enum. I, 71 (1821).

Muhlenbergia willdenovii TRIN. Diss. I, 188 (1828).

Wats. and Coult., Gray's Man. 6 ed. 643; Britt., Fl. N. J. 287; Mac., Fl. Can. II, 195; Upham, Fl. Minn. 161; Chap., Fl. So. St. 552; Cov., Fl. Ark. 235; Vas., Mon. 68.

North America: Ont. to N. Y., N. J. and N. Car.; W. to Minn., Neb., Mo. and Ark.

Minn. valley: S. central district and probably W.; local or infrequent; rocky or gravelly woodland and hillsides.

Muhlenbergia ambigua TORR. Nicollet Rep. (1841).

M. sylvatica var. *setiglumis* WATS. Bot. King. Exp. 378 (1871).

Wats. and Coult., Gray's Man. 6 ed. 643; Upham, Fl. Minn. 161; Vas., Mon. 69.

North America: S. Minn. and Humboldt Pass, Nev. at 6,000 ft. alt.

Minn. valley: Shore of Lake Elysian, Waseca Co., Minn.; local, and possibly exterminated.

HERB.: *Columbia College* (type.), "*Lake Okaman*," Nicollet; *Harvard College*, Wats. 1288; *Humboldt Pass, Nev.*

Muhlenbergia mexicana (LINN.) TRIN. Diss. I, 189 (1823).

Agrostis mexicana LINN. Mant. 31 (1767).

A. lateriflora MICHX. Fl. N. Am. I, 53 (1803).

A. filiformis MUHL. Gram. 66 (1817).

A. foliosa R. and S. Syst. II, 373 (1817).

Cinna mexicana LINK, Enum. I, 71 (1821).

Agrostis lateriflora var. *filiformis* TORR. Fl. U. S. I, 86 (1824).

Muhlenbergia foliosa TRIN. Diss. I, 190 (1828).

Wats. and Coult., Gray's Man. 3 ed. 643; Britt., Fl. N. J. 287; Mac., Fl. Can. II, 194; Upham, Fl. Minn. 161; Vas., Ag. Grasses U. S. 43; Webb., Fl. Neb. 104; Chap., Fl. So. St. 552; Coult., Fl. Colo. 409; Cov., Fl. Ark. 235; Vas., Mon. 69.

North America: N. Br., Q., Ont., L. Superior to Minn., Dak., Wyoming; S. to N. Eng., N. J. and N. Car.; W. to Neb., Mo., Ark. and Ind. Terr.

Minn. valley: Forest district; Ft. Snelling to Blue Earth Co.; low grounds and along streams.

HERB.: *Bailey* 422, Long Lake; *Oestlund* 325, Minneapolis; *Sandberg* 560, Red Wing.

Muhlenbergia racemosa (MICHX.) B. S. P. Cat. N. Y. (1888).

Agrostis racemosa MICHX. Fl. N. Am. I, 53 (1803).

Polypogon glomeratus WILLD. Enum. I, 87 (1869).

Agrostis setosa MUHL. Gram. 68 (1817).

Polypogon racemosus NUTT. Gen. I, 51 (1818).

Trichlochloa glomerata and *calycina* TRIN. Fund. Agrost. 117 (1820).

Muhlenbergia glomerata TRIN. Diss. (1828).

Polypogon setosus SPRENG. Mant. I, 31 (1827).

Cinna racemosa KUNTH, Enum. I, 207 (1833).

Wats. and Coult., Gray's Man. 6 ed. 643; Britt., Fl. N. J. 287; Mac., Fl. Can. II, 194; Vas., Ag. Grasses U. S. 43; Webb., Fl. Neb. 104; Upham, Fl. Minn. 161; Vas., Mon. 68.

North America: N. Br., Q., Ont. to Man., Saskatchewan, Brit. Col. and Rocky Mts.; S. to N. Eng., N. Y. and N. J.; W. to Ill., Minn., Dak., Neb. and Utah.

Minn. valley: Throughout; bogs, moist or dry soil, cultivated fields.

HERB.: *Taylor* 1184½, Glenwood; *Sheldon* 1448, Pipestone; (var. *ramosa* Vasey); *Taylor* 1184, Glenwood; *Sheldon* 1284, Lake Benton; *Sheldon* 1478½, Pipestone; *Ballard* 797, Goose Lake, Carver Co.; *Leiberg* 89, Blue Earth Co.; (all var. *ramosa*); *MacM.* and *Sheld.* 9, Brainerd; *Foot* 4, Worthington; *Sandberg* 559, Red Wing; *Upham* 2, Minneapolis (var. *ramosa* Vas.).

Muhlenbergia sobolifera (MUHL.) TRIN. Diss. I, 187 (1824).

Agrostis sobolifera MUHL. Willd. Enum. 95 (1809).

Cinna sobolifera LINK, Enum. I, 71 (1821).

Wats. and Coult., Gray's Man. 6 ed. 644; Britt., Fl. N. J. 287; Upham, Fl. Minn. 161; Richt., Pl. Eur. I, 42; Cov., Fl. Ark. 235; Vas., Mon. 68.

Central Europe.

North America: Mass. to Mich. and Minn.; S. to N. J., Mo. and Ark.

Minn. valley: Reported from S. E. districts; open or rocky woods.

BRACHYELYTRUM PAL.-BEAUV. *Agrostogr.* 39 (1812).

Benth. and Hook., *Gen. Pl.* III, 1144; Durand, *Ind. Gen. Phan.* 469; Engler and Prantl, *Nat. Pflanz.* 2, II, 47 (Hackel).

Living species: 1; N. America.

Brachyelytrum aristosum (MICHX.) B. S. P. Cat. N. Y. (1888).

Dilepyrum aristosum MICHX. *Fl. N. Amer.* I, 40 (1803).

Muhlenbergia aristata PERS. *Syn.* I, 76 (1805).

Brachyelytrum aristatum P. DE B. *Agrost.* 39 (1812).

Muhlenbergia brachyelytrum TRIN. *Diss.* I, 188 (1828).

Wats. and Coult., *Gray's Man.* 6 ed. 644; Mac., *Fl. Can.* II, 195; Webb., *Fl. Neb.* 104; Chap., *Fl. So. St.* 553; Upham, *Fl. Minn.* 162; Engl. Hackel, *Nat. Pflanz.* II, 2, 47; Cov., *Fl. Ark.* 235; Vas., *Mon.* 71.

North America: N. S., Q., Ont. to Owen Sound and north shore of L. Superior; S. to N. Y., N. J. and Fla.; W. to Minn., Neb., Ark. and Mo.

Minn. valley: Forest district; infrequent; rocky woods and copses.

HERB.: *Ballard* 397, Jordan, Scott Co.; *Bailey* 397, Mud Lake.

ALOPECURUS LINN. *Gen.* 50 (1737).

Colobachne PAL.-BEAUV. *Agrostogr.* 22 (1812).

Tozzettia SAVI, *Mem. Soc. It. Sci.* VIII, 477 (1868).

Benth. and Hook., *Gen. Pl.* III, 1140; Durand, *Ind. Gen. Phan.* 470; Engler and Prantl, *Nat. Pflanz.* 2, II, 48 (Hackel).

Living species: 20; 40 described; Europe and extra tropical Asia; a few species in N. and S. America and Australia, doubtfully indigenous. Europe, 14; Russia, 11; N. America, 8; California, 3; Rocky Mts., 2; So. Sts., 1; Canada, 4-5; E. Sts., 1; Pl. King, 1-2; Pl. Wheel., 1-2; Pac. coast, 7-8.

Alopecurus geniculatus LINN. var. **aristulatus** (MICHX.) MUNRO, *Torr. Fl. U. S.* I, 97 (1824).

A. aristulatus MICHX. *Fl. N. Am.* 43 (1803).

A. subaristatus PERS. *Syn.* I, 80 (1805).

A. fulvus KUNTH, *Enum.* I, 24 (1833).

Wats. and Coult., *Gray's Man.* 6 ed. 645; Britt., *Fl. N. J.* 285; Webb., *Fl. Neb.* 105; Wats., *Fl. Calif.* II, 263; Upham, *Fl. Minn.* 160; Coult., *Fl. Colo.* 407; Mac., *Fl. Can.* II, 188; Vas., *Ag. Grasses U. S.* 40; Richt., *Pl. Eur.* I, 38 (spec.); Miyabe, *Fl. Kur.* 269 (spec.); Wats., *King Exp.* 375; Roth., *Wheel. Exp.* 281; Cov., *Fl. Ark.* 234; Hart., *Scand. Fl.* I, 576 (spec.); Vas., *Mon.* 87.

North America: Newf., Anticosti, N. S., N. Br., Ont., Man., N. W. T., to Columbia and Vancouver; N. to lat. 55°; S. to N. Y., Penn.; W. to Minn., Neb., Colo., Calif., Oregon; not

very abundant south of this range, though occasional even to the Gulf of Mexico.

Minn. valley: Throughout; abundant; in wet meadows or ditches, or along edge of ponds.

HERB.: *Ballard* 265, Jordan, Scott Co.; *Taylor* 83, Lake Custan, Le Sueur Co.; *Sheldon* 213, Lake Ballentyne, Blue Earth Co.; *Sheldon* 688, Waseca; *Sheldon* 916, Sleepy Eye; *Leiberg* 88, Blue Earth Co.; *Sandberg* 555, Chisago Lake.

SPOROBOLUS R. BR. Prodr. 169 (1810).

Vilfa P. BEAUV. Agrostogr. 16 (1812).

Agrosticula RADDI, Agrost. Bras 33 (1823).

Triachyrum HOCHST. Steud. Syn. Glum. I, 176 (1855).

Cryptostachys STEUD. Syn. Glum. I, 181 (1855).

Diachyrium GRISEB. Pl. Lorentz. 209 (1874).

Spermachiton LLAN. Frag. Phil. 25 (1851).

Benth. and Hook., *Gen. Pl.* III, 1148; Durand. *Ind. Gen. Phan.* 470; Engler and Prantl, *Nat. Pflanz.* 2, II, 49 (Hackel).

Living species: 80; temperate and tropical America; some in warmer Africa; Asia; 1 in S. Europe. U. S., 31; Atl. states, 12; Pac. states, 5-6; Texas and Arizona region, 24; Rocky Mts., 10; Canada, 6-7.

***Sporobolus cryptandrus* (TORR.) GRAY**, Man. ed. 2, 542 (1852).

Agrostis cryptandra TORR. Ann. Lyc. N. Y. I, 151 (1824).

Vilfa cryptandra TRIN. Agrost. I, 47 (1840).

Wats. and Coult., Gray's Man. 6 ed. 646; Mac., Fl. Can. II, 197; Webb., Fl. Neb. 104; Wats., Fl. Calif. II, 268; Coult., Fl. Colo. 411; Mac., Fl. Can. II, 391; Wats., King Exp. 375; Upham, Fl. Minn. 160; Vas., Mon. 62.

North America: Ont. to Assiniboia and Brit. Col.; S. to N. Eng., Minn., Kan., Neb., Tex., N. Mex.; W. to Colo. and Oregon.

Minn. valley: Forest district and S. W.; dry or waste places.

HERB.: *Oestlund* 223, 224, Hennepin Co.

***Sporobolus heterolepis* GRAY**, Man. ed. V, 610 (1868).

Vilfa heterolepis GRAY, Ann. Lyc. N. Y. III, 233 (1836).

Wats. and Coult., Gray's Man. 6 ed. 646; Webb., Fl. Neb. 104; Mac., Fl. Can. II, 198; Upham, Fl. Minn. 160; Cov., Fl. Ark. 235; Vas., Mon. 62.

North America: Ont., Georgian Bay, N. W. Man. and Assiniboia; S. to Conn., N. Y., Penn.; W. to Minn., Neb., Mo. and Texas.

Minn. valley: Forest district and westward; infrequent; dry or sandy places; along railways.

HERB.: *Sheldon* 1368, Verdi, Lincoln Co.

Sporobolus junceus (MICHX.) KUNTH, Enum. I (1833).*Agrostis juncea* MICHX. Fl. N. A. I (1803).*Vilfa juncea* TRIN. Diss. (1828).

Wats. and Coult., Gray's Man. 6 ed. 646; Upham, Fl. Minn. 160; Chap., Fl. So. St. 550; Vas., Mon. 63.

North America: Penn. to Wis., Minn. and Dak.; S. to Fla. and La.; more abundant southward. Tex.

Minn. valley: Reported from S. central district; rare; dry or barren localities.

Sporobolus depauperatus (TORR.) SCRIB. Torr. Bull. IX 103 (1882).*Vilfa depauperata* TORR. Hook., Fl. II, 257 (1840).*V. utilis* TORR. Pac. R. R. Rep. V, 365 (1856).

Wats. and Coult., Gray's Man. 6 ed. 646; Vas., Mon. 61; Mac., Fl. Can. II, 197; Webb., Fl. Neb. 104; Coult., Fl. Colo. 411; Upham, Fl. Minn. 160.

North America: Brit. Colo. and Rocky mt. region to Arizona and Mexico.

Minn. valley: S. c. to W. districts; dry or waste places.

HERB.: *Sheldon 1591½*, Lake Benton; *Leiberg 108, 109*, Blue Earth Co.

Sporobolus cuspidatus (TORR.) SCRIB. Torr. Bull. IX, 103 (1882).*Vilfa cuspidata* TORR.*? Agrostis cryptandra* TORR. Ann. Lyc. N. Y. I, 151 (1824).

Wats. and Coult., Gray's Man. 6 ed. 646; Webb., Fl. Neb. 103; Upham, Fl. Minn. 160; Coult., Fl. Colo. 411; Mac., Fl. Can. II, 197; Vas., Mon. 60.

North America: N. Br., Q., Ont., Man., Saskatchewan and Rocky mts.; S. to Maine, Minn., Iowa, Neb. and Mo.; W. to Colo.

Minn. valley: Reported from N. E. and S. E. districts; dry or barren localities.

Sporobolus vaginæflorus (TORR.) VAS. Cat. Grass. U. S. 45 (1885).*Agrostis virginica* MUHL. Gram. 74 (1817) not Linn.*Vilfa vaginæflora* TORR. in Gray Gram. and Cyp. I, 3 (1834).

Wats. and Coult., Gray's Man. 6 ed. 645; Upham, Fl. Minn. 160; Britt., Fl. N. J. 288; Chap., Fl. So. St. 551; Webb., Fl. Neb. 104; Mac., Fl. Can. II, 198; Cov., Fl. Ark. 235; Vas., Mon. 60.

North America: Maine to Ont. and Minn.; S. to N. J., N. Car.; W. to Neb., Mo., Ark. and Tex.

Minn. valley: N. E. district and to S. central district; barren or waste places.

Sporobolus asper (MICHX.) KUNTH, Enum. I, 210 (1833).*Agrostis aspera* MICHX. Fl. N. Am. I, 53 (1803).*Vilfa aspera* P. DE B. Agrost. 16 (1812).? *Muhlenbergia clandestina* TRIN. Diss. I, 190 (1824).*Vilfa hookeri* TRIN. Agrost. 84 (1840).*Agrostis clandestina* SPRENG. Syst. I, 32 (1824).*Vilfa longifolia* TORR. in Gray, Gram. 4 (1834).*Agrostis longifolia* TORR. Fl. U. S. I, 90 (1824).

Wats. and Coult., Gray's Man. 6 ed. 645; Britt., Fl. N. J. 288; Upham, Fl. Minn. 160; Webb., Fl. Neb. 103; Chap., Fl. So. St. 551; Cov., Fl. Ark., 235; Vas., Mon. 59.

North America: N. Eng., N. J., Va. and Fla.; W. to Minn., Neb. and Ark.

Minn. valley: Reported from S. central district; sandy hills, fields, dry places and roadsides.

CINNA LINN. Gen. ed. V, 15 (1754).**Abola** ADANS. Fam. II, 31 (1763).**Blyttia** FRIES, Novit. Fl. Suec. Mant. II, 2 (1839).

Benth. and Hook., Gen. Pl. III, 1151; Durand, Ind. Gen. Phan. 471; Engler and Prantl, Nat. Pflanz. 2, II, 50 (Hackel).

Living species: 2; N. Europe and N. America. N. America, 2; Europe, 1.

Cinna arundiuacea LINN. Spec. 7 (1753).*Agrostis cinna* LAM. Ill. I, 162 (1791).*Muhlenbergia cinna* TRIN. Diss. I, 191 (1824).*M. pendula* BONG. ex. Vas. Mon. l. c. (1892).*Blyttia suaveolens* FRIES, Mant. II, 2 (1832-42).*Cinna latifolia* GRISEB. Ledeb. Fl. Ross. IV, 435 (1853).

Wats. and Coult., Gray's Man. 6 ed. 649; Britt., Fl. N. J. 289; Mac., Fl. Can. II, 202; Upham, Fl. Minn. 161; Vasey, Ag. Grasses U. S. 47; Chap., Fl. So. St. 552; Engl. Hackel, Nat. Pflanz. II, 2, 50; Cov., Fl. Ark. 235; Vas., Mon. 57.

North America: Newf., N. S., Q., Ont. to Saskatchewan; S. to N. Eng., N. Y., N. J., N. Car.; W. to Minn., Ark., La. and Tex.; N. Rocky mts. to Oregon and Washington.

Minn. valley: Forest district; infrequent; woods and swamps.

AGROSTIS LINN. Gen. 54 (1737) p. p.**Vilfa** ADANS. Fam. II, 495 (1763).**Trichodium** MICHX. Fl. Bor.-Am. I, 41 (1803).**Agraulus** P. BEAUV. Agrostogr. 5 (1812).**Bromidium** NEES, Pl. Meyen, 154 (1835).**Didymochæta** STEUD. Syn. Glum. I, 185 (1855).**Chamæcalamus** MEYEN, Pl. Reise I, 456 (1835).

Benth. and Hook., Gen. Pl. III, 1149; Durand, Ind. Gen. Phan. 471; Engler and Prantl, Nat. Pflanz. 2, II, 50 (Hackel).

Living species: 100; cosmopolitan; especially in N. temperate regions. Europe, 38; Russia, 20; N. America, 26; Canada, 15; California, 14; E. Sts., 6; Rocky mts., 5; Pl. Wheel., 7; Pl. King, 4.

Agrostis hiemalis (WALT.) B. S. P. Cat. N. Y. (1888).

Cornucopia hiemalis WALT. Fl. Car. 74 (1788).

Agrostis scabra WILLD. Spec. I, 370 (1799).

Trichodium laxifolium MICHX. Fl. N. Am. I, 42 (1803).

T. scabrum MUHL. Gram. 61 (1817).

Agrostis laxiflora HOOK. Fl. Bor.-Am. II, 240 (1840) in part.

A. oreophila TRIN. Agrost. II, 77 (1841).

A. michauxii TRIN. Agrost. II (1841).

Wats. and Coult., Gray's Man. 6 ed. 648; Britt., Fl. N. J. 288; Webb., Fl. Neb., 103; Mac., Fl. Can. II, 199; Chap., Fl. So. St. 551; Wats., Fl. Calif. II, 274; Coult., Fl. Colo. 412; Wats., King Exp. 377; Roth., Wheel. Exp. 283; Cov., Fl. Ark. 235; Vas., Mon. 75.

Siberia.

North America: Newf., Ont., Man., Brit. Col. to 60° N. lat., Athabasca and Unalascha; S. to N. Eng., N. J., Fla.; W. throughout the continent.

Minn. valley: Forest district, and perhaps throughout; dry or sunny banks and openings in forest.

HERB.: *Taylor* 657, Cobb river, Blue Earth Co.; *Sheldon* 662, Waseca; *Ballard* 639, Chaska; *Ballard* 251, Jordan, Scott Co.; *MacM. and Sheld.* 71, Brainerd; *Bailey* 129, Vermilion Lake; *Sandberg* 558, Red Wing; *Herrick* 338, Minneapolis.

Agrostis rubra LINN. var. **alpina** (Oakes).

A. canina var. *alpina* OAKES, Cat. Vermont Pl. (1842).

A. pickeringii TUCK. Sill. Journ. XLV, 42 (1843).

A. rupestris CHAP. Fl. So. St. 551 (1860) not all.

A. canina GRAY, Man. ed. V, 611 (1867).

A. rubra var. *americana* SCRIBN. Mac., Fl. Can. II, 391 (1890).

Wats. and Coult., Gray's Man. 6 ed. 648; Chap., Fl. So. St. 551; Coult., Fl. Colo. 412; Mac., Fl. Can. II, 198; Wats., King Exp. 377; Upham, Fl. Minn. 161.

North America: Newf., N. S., N. Br., Q., to N. Y., N. J. and N. Car.; W. across cont.; Alaska?

Minn. valley: Reported from S. W. edge; high plains and headlands; rare.

Agrostis perennans (WALT.) TUCKERM. Gray, Man. ed. V, 611 (1868).

Cornucopia perennans WALT. Fl. Car. 74 (1788).

Trichodium decumbens MICHX. Fl. N. Am. I, 42 (1803).

T. perennans ELL. Sk. Car. (1823).

Agrostis laxiflora RICH. Parr. Voy. Appx. (1823).

Wats. and Coult., Gray's Man. 6 ed. 648; Britt., Fl. N. J. 288; Webb., Fl. Neb. 103; Upham, Fl. Minn. 160; Mac., Fl. Can. II, 199; Coult., Fl. Colo. 412; Chap., Fl. So. St. 551; Miyabe, Fl. Kur. 269?; Mac., Fl. Can. II, 392; Roth., Wheel. Exp. 283; Cov., Fl. Ark. 235; Vas., Mon. 76.

Kurile Isls. (?)

North America: Q., Ont., Ott. to N. Eng., N. J. and Fla.; W. to Minn., Neb., Wyoming, Montana and N. W. coast.

Minn. valley: S. W. and S. central districts; probably throughout; damp and shaded banks or woodland.

HERB.: *Sheldon* 863, Sleepy Eye.

DEYEUXIA CLARION in Pal. Beauv. Agrostogr. 43 (1812).

Lachnagrostis TRIN. Fund. Agr. 128 (1820).

Achaeta FOURN. Gram. Mex. 109 (1880).

Relchella STEUD. Syn. Glum. I, 101 (1855).

Cinnastrum FOURN. Gram. Mex. 90 (1880).

Benth. and Hook., *Gen. Pl.* III, 1152; Durand, *Ind. Gen. Phan.* 471; Engler and Prantl, *Nat. Pflanz.* 2, II, 51 (Hackel).

Living species: 120; temperate and colder regions; mts. of tropics; Andes region, 60; U. S., 28; Europe, 13; Pac. America, 23; Atl. America, 7-8; S. Sts., 3; Canada, 24-26.

Deyeuxia neglecta (EHRH.) KUNTH, Enum. I, 76 (1833).

Arundo neglecta EHRH. Beitr. VI, 137 (1791).

Calamagrostis neglecta GAERTN. Fl. Wett. I, 94 (1799).

Arundo stricta "TIMM. Mecklb. Mag. II, 236"; ex Richt., Pl. Eur. I, 50 (1890).

Calamagrostis stricta NUTT. Gen. I, 47 (1818).

Wats. and Coult., Gray's Man. 6 ed. 650; Mac., Fl. Can. II, 205; Coult., Fl. Colo. 414; Webb., Fl. Neb. 103; Wats., Fl. Calif. II, 281; Upham, Fl. Minn. 162; Trautv., Fl. Sib. 142; Led., Fl. Ross. IV, 428; Vas., Mon. 82; Rothr., Alask. 459.

Europe; temperate Asia.

North America: N. Br., Q., Ont. to L. Superior region, Assiniboia, Rocky mts. and Selkirks; N. to Hudson Bay and 62° N. lat. and Pac. coast; S. to Calif., Colo., Neb., Iowa and Wisc. Labrador.

Minn. valley: Forest district to S. central district; rocky woods or low meadows.

HERB.: *Cratty* 2, Emmet Co., Iowa; state line.

Deyeuxia canadensis (MICHX.) P. DE B. Agrost. (1812).

Arundo canadensis MICHX. Fl. N. Am. I, 73 (1803).

Calamagrostis canadensis P. DE B. Agrost. (1812).

Arundo agrostoides PURSH, Fl. Am. 83 (1814).

A. cinnoides MUHL. Gram. 187 (1817).

Calamagrostis mexicana NUTT. Gen. I, 46 (1818).

Wats. and Coult., Gray's Man. 6 ed. 650; Mac., Fl. Can. II, 204; Upham, Fl. Minn. 162; Britt., Fl. N. J. 289; Webb., Fl. Neb. 103; Vas., Ag.

Grasses U. S. 48; Wats., Fl. Calif. II, 279; Coult., Fl. Colo. 413; Led., Fl. Ross. IV, 429; Mac., Fl. Can. II, 393; Roth., Wheel. Exp. 285; Cov., Fl. Ark. 235; Vas., Mon. 80; Rothr., Alask. 459.

Baikal region, Siberia to Unalascha.

North America: Newf., Hudson Bay to Sitka, Alaska; S. throughout Can.; S. to N. Eng., N. J. and Va.; W. to Rocky mts. and N. Mex.

Minn. valley: Throughout; principally forest district; meadows and along streams.

HERB.: *Ballard* 374, Helena, Scott Co.; *Ballard* 582, Rice Lake, Scott Co.; *Sandberg* 561, Red Wing; *Roberts* 262, Agate Bay; *Bailey* 529, Agate Bay; *Bailey* 10, Vermilion Lake; *Bailey* 256, Vermilion Lake; *Sandberg* 562, Chisago Co.

AMMOPHILA HOST. Gram. Austr. IV, 24 (1809).

Psamma P. BEAUV. Agrostogr. 143 (1812).

Calamovilfa HACKEL in Scrib. Trans. Gram. (1890).

Benth. and Hook., *Gen. Pl.* III, 1153; Durand, *Ind. Gen. Phun.* 471; Engler and Prantl, *Nat. Pflanz.* 2, II, 51 (Hackel).

Living species: 4 or more?; N. America, 4; N. hemisphere, 2; Atl. N. America, 4; Pac. N. America, 2.

Ammophila longifolia (HOOK.) B. and H. *Gen. Pl.* III, 1153 (1883).

Calamagrostis longifolia HOOK. Fl. Bor.-Am. II, 241 (1840).

Calamovilfa longifolia HACK. in Scrib. and Southw. trans. Engl. and Prantl, *Nat. Pflanz.* II, 2, (Gramin. Hackl.) 113 (1890).

Wats. and Coult., Gray's Man. 6 ed. 651; Mac., Fl. Can. II, 208; Upham, Fl. Minn. 162; Webb., Fl. Neb. 103; Coult., Fl. Colo. 413; Cov., Fl. Ark. 235; Vas., Mon. 84.

North America: Prairie region of Canada; S. to Minn., Ill., Neb., Dak., Kan., Mich., Ark., Colo. and Arizona; W. to Utah.

Minn. valley: Throughout at lower levels; sandy shores of lakes and streams.

HERB.: *Sheldon* 1226, Iberia, Brown Co.; *Taylor* 838, Glenwood; *MacM. and Sheld.* 11, Brainerd; *Oestlund* 526, Minneapolis; *Sandberg* 563, Red Wing.

DESCHAMPSIA BEAUV. Agrostogr. 91 (1812).

Campella LINK, Hort. Berol. I, 122 (1827).

Vahledia FRIES, Bot. Notiz. (1842).

Avenella PARLAT. Fl. It. I, 244 (1848).

Lerchenfeldia SCHUR. Transsylv. 753 (1866).

Monandraira EM. DESV. Gay, Fl. Chile VI, 341 (1845).

Airidium and **Rytidosperma** STEUD. Syn. Glum. I, 423, 425 (1855).

Peyritschia FOURN. Gram. Mex. 109 (1880).

Campella GRISEB. ex Dur. l. c. (1888).

Benth. and Hook., *Gen. Pl.* III, 1157; Durand, *Ind. Gen. Phan.* 472; Engler and Prantl, *Nat. Pflanz.* 2, II, 54 (Hackel).

Living species: 20; cosmopolitan; in tropical mts. Europe, 11; Russia, 7; N. America, 8; California, 5; Canada, 6-7; Rocky mts., 4; S. Sts., 1; E. Sts., 3.

Deschampsia caespitosa (LINN.) BEAUV. Agr. 91 (1812).

Aira caespitosa LINN. Spec. 64 (1753).

A. breviaristata GILIB. Exerc. Phyt. II, 528 (1792).

A. altissima MOENCH, Meth. 182 (1794).

Calamagrostis arundo ROTH. Tent. Germ. II, 88 (1789).

C. leersii KOEL. Gram. 107 (1802).

Aira ambigua MICHX. Fl. N. Am. I, 61 (1803).

Campella caespitosa LINK, Hort. Berol. I, 122 (1827).

Avena caespitosa GRIS. K. Schr. 52 (1836).

A. stolonifera HAUSM. Fl. Tir. 980 (1851-55).

A. wibeliana SCHUR. Oe. Bot. Zeit. IX, 326 (1859).

A. hartmanniana NYM. Consp. Fl. Eur. 807 (1882).

Wats. and Coult., Gray's Man. 6 ed. 652; Britt., Fl. N. J. 290; Mac Fl. Can. II, 209; Coult., Fl. Colo. 414; Wats., Fl. Calif. II, 297; Upham, Fl. Minn. 171; Richt., Pl. Eur. I, 56; Led., Fl. Ross. IV, 421; Engl. Hackel, Nat. Pflanz. II, 2, 54; Hook., Fl. Gt. Brit. 483; Trautv., Fl. Sib. 141.

Europe and Asia; cosmopolitan.

North America: Newf. and N. S. to Peace river valley and Alaska; S. to N. Eng., N. J. and W. across cont. to California.

Minn. valley: Forest district to Blue Earth Co.; rare; shores of streams and lakes.

HERB.: *Bailey* 424, Fall Lake.

AVENA LINN. Gen. 42 (1737).

Heuffelia SCHUR. Transsylv. 760 (1866).

Helicotrichum BESS. Reich., Fl. Germ. Exc. 140 b (1830).

Benth. and Hook., *Gen. Pl.* III, 1160; Durand, *Ind. Gen. Phan.* 472; Engler and Prantl, *Nat. Pflanz.* 2, II, 55 (Hackel).

Living species: 50; temperate regions, especially in the Old World. Europe, 39; Russia, 22; N. America, 2-3; Canada, 2; California, 1; E. Sts., 2; Rocky mts., 1; Pl. King, 2.

Avena striata MICHX. Fl. N. Am. I, 73 (1803).

Trisetum purpurascens TORR. Fl. U. S. I, 127 (1824).

Wats. and Coult., Gray's Man. 6 ed. 673; Britt., Fl. N. J. 291; Mac., Fl. Can. II, 213; Coult., Fl. Colo. 415; Upham, Fl. Minn. 171.

North America: N. S., N. Br., Q., Ont., Man., Brit. Col. and Rocky mts.; S. to N. Eng., N. Y. and N. J.; W. to Minn. and Colo.

Minn. valley: Forest district; W. to New Ulm and Cottonwood valley; hillsides and riverbanks.

HERB.: *Sandberg* 595, Washington Co.

DANTHONIA DC. Fl. Fr. III, 32 (1805) p. p.

Streblochaeta HOCHST. Pl. Schimp. Abyss. n. 412 (1835?).

Pentameris BEAUV. Agrostogr. 92 (1812).

Triraphis NEES, Pl. Afr. Austr. Glum. 270 (1841).

Chaetobromus NEES, Lindl., Ind. Nat. Syst. ed. 2, 449 (1835).

Monachather STEUD. Syn. Glum. I, 247 (1855).

Plinthanthesis STEUD. l. c. I, 14 (1855).

Crinipes HOCHST. Flora, 279 (1855).

Benth. and Hook., *Gen. Pl.* III, 1162; Durand, *Ind. Gen. Phan.* 473; Engler and Prantl, *Nat. Pflanz.* 2, II, 56 (Hackel).

Living species: 100; temperate and warmer regions; more than half are in S. Africa. Europe, 1; N. America, 5-6; California, 2-3; Pac. coast, 1 end. sp.; Canada, 4-5; Rocky mts., 2-3; S. Sts., 3; E. Sts., 3.

Danthonia spirata (LINN.) BEAUV. Agr. 55 (1812).

Avena spicata LINN. Spec. 119 (1753).

A. glumacea MICHX. Fl. N. Am. I, (1803).

Wats. and Coult., *Gray's Man.* 6 ed. 654; Britt., Fl. N. J. 291; Mac., Fl. Can. II, 214; Upham, Fl. Minn. 170; Chap., Fl. So. St. 569; Roth., Wheel. Exp. 293; Cov., Fl. Ark. 235.

North America: Atl. to Pac. in Can.; N. to N. S., Peace river and Vancouver; S. to N. Eng., N. J. and Fla.: W. to Minn., Mo. and Ark.

Minn. valley: Reported from S. central and S. W. districts; rare or local; dry or sandy or gravelly places.

SPARTINA SCHREB. Gen. Pl. 43 (1789).

Trachynotia MICHX. Fl. Bor. Am. I, 63 (1803).

Limnetis PERS. Syn. I, 72 (1805).

Poncelletia THOU. Fl. Trist. d'Achun. 36 (1806).

Solenache STEUD. Syn. Glum. I, 12 (1855).

Benth. and Hook., *Gen. Pl.* III, 1108; Durand, *Ind. Gen. Phan.* 473; Engler and Prantl, *Nat. Pflanz.* 2, II, 58 (Hackel).

Living species: 7; saline localities; 3, Atl. coast regions; prairies of N. America, 2; Montevideo, 1; Tristan d'Achuna, Amsterdam, Isl. St. Paul, 1. Europe, 1 (Mediterranean region); N. America, 6; Canada, 6; California, 2-3; S. Sts., 4; Rocky mts., 2; E. Sts., 4-5; Pl. King., 1; Pl. Wheel., 1.

Spartina cynosuroides (LINN.) WILLD. Enum. I, 80 (1809).

Dactylis cynosuroides LINN. Spec. 71 (1753).

Trachynotia cynosuroides and *polystachya* MICHX. Fl. N. Am. I, 64 (1803).

Limnetis cynosuroides and *polystachya* PERS. Syn. I, 72 (1805).

Spartina polystachya MUHL. Gram. 53 (1817).

Wats. and Coult., Gray's Man. 6 ed. 627; Britt., Fl. N. J. 283; Upham, Fl. Minn. 164; Coult., Fl. Colo. 405; Mac., Fl. Can. II, 182; Webb., Fl. Neb. 106; Wats., Fl. Calif. II, 290; Cov., Fl. Ark. 233.

North America: N. S., Q., Ont., Man. to Saskatchewan, Assiniboia and Little Slave lake; S. to N. J. and W. to Neb., Ark., Ind. Terr., Colo. and California.

Minn. valley: Throughout; abundant; banks of streams, moist prairies and low meadows.

HERB.: *Ballard* 531, Cleary's Lake, Scott Co.; *Ballard* 786, Swan Lake, Carver Co.; *Ballard* 649, Chaska; *Sheldon* 1538, Lake Benton; *Taylor* 1000, Glenwood; *Sheldon* 741, Sleepy Eye; *MacM.* and *Sheld.* 10, Brainerd; *Sandberg* 565, Red Wing; *Foot* 5, Worthington; *Oestlund* 327, Hennepin Co.; *Herb. Sheld.* 1653, Minneapolis.

SCHEDONNARDUS STEUD. Syn. Glum. I, 146 (1855).

Benth. and Hook., *Gen. Pl.* III, 1167; Durand, *Ind. Gen. Phan.* 473; Engler and Prantl, *Nat. Pflanz.* 2, II, 59.

Living species: 1; North America.

Schedonnardus paniculatus (NUTT.) COV. Fl. Ark. 236 (1891).

Lepturus paniculatus NUTT. Gen. I, 81 (1818).

Rotboellia paniculata SPRENG. Syst. II, (1825).

Schedonnardus texanus STEUD. Syn. Glum. I, 146 (1855).

Wats. and Coult., Gray's Man. 6 ed. 655; Webb., Fl. Neb. 103; Upham, Fl. Minn. 169; Wats., Fl. Calif. II, 322; Coult., Fl. Colo. 416; Mac., Fl. Can. II, 215; Engl. Hackel, *Nat. Pflanz.* II, 2, 69; Roth., *Wheel. Exp.* 293.

North America: Assiniboia, Man., Minn. to Ill., Mont., Neb., Colo., Calif., Ark., N. Mex. and Tex.

Minn. valley: Reported from S. W. edge; rare and doubtful; high plains and sterile ridges.

HERB.: *Leiberg* 101, Rock Co., state line.

BOUTELOUA LAGASC. Var. Cienc. y. Litt. 141 (1805).

Eutriana TRIN. Fund. Agr. 161 (1820).

Actinochloa WILLD. R. and S. Syst. II, 22, 417 (1817).

Chondrosium DESVX. Bull. Philom. II, 188 (1813).

Atheropogon MUHL. Willd. Spec. IV. 937 (1805).

Dinebra D C. Cat. Hort. Monsp. 104 (1813) p. p.

Heterosteca DESVX. Bull. Philom. II. 188 (1813).

Aristidium ENDL. Gen. 94 (1836).

Triathera DESVX. l. c. (1813).

Triaena H B K. Nov. Gen. et Spec. I, 178 (1815).

Polyodon H B K. l. c. I, 174 (1815).

Triplathera ENDL. Gen. 94 (1833).

? *Corethrum* VAHL, Sk. Kiobenh. VI, 85 (1810).

Benth. and Hook., *Gen. Pl.* III, 1168; Durand, *Ind. Gen. Phan.* 473; Engler and Prantl, *Nat. Pflanz.* 2, II, 59 (Hackel).

Living species: 30; plateaus of S. W. United States; a few generally distributed in North America and in S. America. Rocky mts., 5; California, 3-4; Canada, 3; E. Sts., 3; S. Sts., 2; Pl. Wheel., 8; Tex., Mex. and Arizona, 23.

***Bouteloua curtipendula* (MICHX.) GRAY**, *Man. ed.* v. 621 (1868).

Chloris curtipendula MICHX. *Fl. N. Am.* I, 159 (1803).

Atheropogon aphudioides MUHL. *Willd. Spec.* IV, 927 (1805).

Bouteloua racemosa LAG. *Varied. de Cienc.* (1805).

Cynosurus secundus PURSH, *Fl. Am.* 728 (1814).

Eutriana curtipendula TRIN. *Diss.* I, 243 (1828).

Wats. and Coult., *Gray's Man.* 6 ed. 656; Britt., *Fl. N. J.* 292; Webb., *Fl. Neb.* 103; Mac., *Fl. Can.* II, 216; Coult., *Fl. Colo.* 417; Upham, *Fl. Minn.* 164; Vas., *Ag. Grasses U. S.* 57; Engl., Hackel, *Nat. Pflanz.* 2, II, 59; Roth., *Wheel. Exp.* 286; Cov., *Fl. Ark.* 236.

Peru.

North America: Ont. to Man.; S. to Mex. and C. Amer.; W. to Colo. and Arizona; E. to Minn., Neb., Ark., Ill., Wisc., N. Y. and N. J.

Minn. valley: Throughout; especially prairie districts; dry prairies and ridges.

HERB.: *Sheldon* 823, Cottonwood valley, near Sleepy Eye; *Sheldon* 1129, Springfield; *Sheldon* 1376, Lake Benton; *Sheldon* 1173, New Ulm; *Taylor* 735, Glenwood; *Sheldon* 957, Redwood Falls; *MacM. and Sheld.* 12, Brainerd; *Foote* 6, Worthington; *Oestlund* 328, Minneapolis; *Oestlund* 329, Minneapolis; *Sandberg* 567, Goodhue Co.; *Herb. Sheld.* 1707, Minneapolis.

***Bouteloua hirsuta* LAG.** *Var. Cienc. y. Litt.* (1805).

Chondrosium hirtum H B K. *N. Gen. et. Spec.* (1815)

Atheropogon papillosus ENGELM. *Am. Jour. Sci.* XLVI (1843).

Chondrosium foenum TORR. *Marcy Rep.* 157 (1848).

Bouteloua foena TORR.

Wats. and Coult., *Gray's Man.* 6 ed. 656; Upham, *Fl. Minn.* 164; Webb., *Fl. Neb.* 103; Mac., *Fl. Can.* II, 215; Coult., *Fl. Colo.* 416; Roth., *Wheel. Exp.* 32, 288.

North America: Alberta to Colo. and Mex.; E. to Tex., Neb., Ill. and Minn.

Minn. valley: Throughout; dry or sandy fields and ridges.

HERB.: *Sheldon* 1167, New Ulm; *Sheldon* 1444, Pipestone; *Taylor* 736, Glenwood; *Sheldon* 1341, Lake Benton; *Sheldon* 1380, Norwegian creek, Lincoln Co.; *Sheldon* 1654, Minneapolis; *MacM. and Sheld.* 21, Brainerd; *Ballard* 24a,

Zumbrota; *Leiberg* 93, Blue Earth Co.; *Sawberg* 566, Cannon Falls.

Bouteloua oligostachya (NUTT.) TORR. Gray's Man. ed. v. 621 (1868).

Atheropogon oligostachyum NUTT. Gen. I, 78 (1818).

Chondrosium oligostachyum TORR. Marcy's Rep. 300 (1853).

Eutriania oligostachyum KUNTH, Enum. I, (1833).

Wats. and Coult., Gray's Man. 6 ed. 656; Upham, Fl. Minn. 164; Webb., Fl. Neb. 103; Mac., Fl. Can. II, 216; Coult., Fl. Colo. 416; Wats., Fl. Calif. II, 291; Vas., Ag. Grasses U. S. 57; Roth., Wheel. Exp. 32, 288; Cov., Fl. Ark. 236.

North America: Man.. Saskatchewan, Assiniboia and Rocky mts.; S. to Tex. and Mex.; W. to S. Calif.; E. to Wisc. and Iowa.

Minn. valley: S. central district and S. W.; plains and high meadows.

HERB.: *Leiberg* 92, Blue Earth Co.

BECKMANNIA HOST. Gram. Austr. III, 5 (1805).

Bruchmannia NUTT. Gen. I, 48 (1818).

Joachimea TEN. ex Kunth, Enum. I (1833).

Benth. and Hook., Gen. Pl. III, 1099; Durand, Ind. Gen. Phan. 474; Engler and Prantl, Nat. Pflanz. 2, II, 60 (Hackel).

Living species: 1; E. and S. E. Europe; temperate Asia and N. America.

Beckmannia erucaeformis (LINN.) HOST. Gram. III, 5 (1805).

Phalaris erucaeformis LINN. Spec. 55 (1753).

Cynosurus erucaeformis AIT. Hort. Kew. I, 105 (1789).

Paspalum aristatum MOENCH, Meth. 196 (1794).

Beckmannia erucoides BEAUV. Agr. 13 (1812).

Bruchmannia erucaeformis NUTT. Gen. I, 48 (1818).

? *Beckmannia erucaeformis* var. *uniflora* SCRIBN.

Wats. and Coult., Gray's Man. 6 ed. 628; Webb., Fl. Neb. 107; Upham, Fl. Minn. 171; Mac., Fl. Can. II, 176; Wats., Fl. Calif. II, 264; Coult., Fl. Colo. 403; Vas., Agr. Grasses U. S. 24; Engl. Hackel, Nat. Pflanz. II, 2, 60; Led., Fl. Ross. II, 453; Richt., Pl. Eur. I, 67; Trautv., Fl. Sib. 144; Wats., King Exp. 393; Roth., Wheel. Exp. 295.

S. Europe and the Orient to Caucasus, Siberia and Dahuria.

North America: Iowa, Minn., Neb., Dak. to Calif., Oregon, Wash., Brit. Col.; N. to L. Misstassini, Man.

Minn. valley: S. W. and W. districts; near edges of ponds; local or rare.

HERB.: *Sheldon* 1260, Lake Benton; *MacM. and Sheld.* 8, Brainerd; *Leiberg* 102, Pipestone quarry; *MacM.* 21, Morton.

BULBILIS RAF. Am. Mo. Mag. (1819).*Sesleria* NUTT. Gen. I, 64 (1818) not Linn.*Calanthera* NUTT. MSS. ex B. and H. l. c. (1883) not Kunth.*Buchloe* ENGELM. Trans. St. L. Acad. 432 (1859).

Benth. and Hook., *Gen. Pl.* III, 1173; Durand, *Ind. Gen. Phan.* 474;
Engler and Prantl, *Nat. Pflanz.* 2, II, 61 (Hackel); O. Kuntze, *Rev. Gen.*
II, 763.

Living species: 1; N. America.

Bulbilis dactyloides (NUTT.) RAF. Am. Mo. Mag. (1819).*Sesleria dactyloides* NUTT. Gen. I, 65 (1818).*Calanthera dactyloides* KUNTH (?), *Journ. Bot.* VIII, 18 (1856?).*Antephora axilliflora* STEUD. *Glum.* I, 111 (1855).*Buchloë dactyloides* ENGELM. Trans. Acad. St. Louis I (1859).

Wats. and Coult., *Gray's Man.* 6 ed. 657; Upham, *Fl. Minn.* 165; Coult.,
Fl. Colo. 417; Upham, *Fl. Minn.* 165; Vas., *Ag. Grasses U. S.* 59; Engl.
Hackel, *Nat. Pflanz.* II, 2, 61; Roth., *Wheel. Exp.* 288.

North America: Saskatchewan to Minn., Iowa, Kan.,
Tex. and N. Mex.; W. to Dak., Colo., Arizona.

Minn. valley: Reported from S. W. edge; infrequent
or exterminated; dry plains.

HERB.: *Leiberg 94*, Pipestone quarry.

PHRAGMITES TRIN. *Fund. Agr.* 134 (1820) p. p.*Arundo* BEAUV. *Agrostogr.* 60 (1812).*Czernya* PRESL, *Cyp. et Gram. Sic.* 22 (1820).*Trichoon* ROTH, *Roem. Arch.* I, 3, 37 (1798).

Benth. and Hook., *Gen. Pl.* III, 1179; Durand, *Ind. Gen. Phan.* 475;
Engler and Prantl, *Nat. Pflanz.* 2, II, 68 (Hackel); Schenck, *Palaeophyt.*
385.

Living species: 3; 1 cosmopolitan; 1 tropical Asia;
1 Argentine Republic.

Fossil species: 1, cretaceous, N. America (*Lesquereaux*);
1 tertiary, Hungary (*Stur.*); 1 tertiary, Europe, America,
polar regions (*A. Br.*).

Phragmites phragmites (LINN.).*Arundo phragmites* LINN. *Spec.* 81 (1753).*A. vulgaris* LAM. *Fl. Fr.* III, 615 (1778).*A. vulnerans* GILIB. *Exerc. Phyt.* II, 541 (1792).*Phragmites communis* TRIN. *Fund. Agr.* 154 (1820).*Czernia arundinacea* PR. *Gram.* 22 (1820).*Arundo graeca* LINK, *Linn.* IX, 136 (1834).*Phragmites graecus* STEUD. *Nom. ed.* 2, II, 324 (1841).*Arundo aggerum* KIT. *Linn.* XXXII, 309 (1863).*Phragmites vulgaris* B. S. P. *Cat. N. Y.* (1888).

Wats. and Coult., *Gray's Man.* 6 ed. 658; Mac., *Fl. Can.* II, 216; Britt.,
Fl. N. J. 293; Webb., *Fl. Neb.* 102; Vas., *Ag. Grasses U. S.* 60; Coult., *Fl.*
Colo. 418; Wats., *Fl. Calif.* II, 300; Chap., *Fl. So. St.* 567; Richt., *Pi. Eur.*
I, 71; Engl. Hackel, *Nat. Pflanz.* II, 2, 68; Nym., *Fl. Eur.*, *Led.*, *Fl. Ross.*

IV, 392; Hook., Fl. Gt. Brit. 487; Miyabe, Fl. Kur. 270; Wats., King Exp. 390; Roth., Wheel. Exp. 293; Cov., Fl. Ark. 236; Hart., Fl. Scand. I, 514; Upham, Fl. Minn. 168.

Europe and Asia; cosmopolitan.

North America: N. S. to Winnipeg, Athabasca, Brit. Col. and Pac. coast; S. to Fla. and Mex.; W. to S. Cal.

Minn. valley: Throughout; especially prairie districts; edges of streams and ponds.

HERB.: *Ballard* 783, Swan Lake, Carver Co.; *Sheldon* 1053, Sleepy Eye; *MacM. and Sheld.* 3, Brainerd.

ERAGROSTIS BEAUV. Agrostogr. 70 (1812).

Macroblepharos PHILIPPI, Linn. XXIX, 100 (1855).

Harpachne HOCHST. A. Rich., Fl. Abyssin. II, 431 (1851).

Coelachyrum NEES, Linn. XVI, 221 (1842).

Megastachya BEAUV. Agrostogr. 74 (1812).

Cladoraphis FRANCH. ex Dur. l. c. (1888).

Benth. and Hook., *Gen. Pl.* III, 1186, Durand, *Ind. Gen. Phan.* 476; Engler and Prantl, *Nat. Pflanz.* 2, II, 69 (Hackel).

Living species: 100; cosmopolitan; principally in the tropics. Europe, 5; Russia, 4; N. America, 10-12; S. Sts., 10-11; E. Sts., 7; Canada, 1; California, 3-4; Rocky mts. 1; Pl. King, 2; Pl. Wheel., 3.

Eragrostis pectinacea (MICHX.) GRAY, Man. ed. V, 622 (1868).

Poa pectinacea MICHX. Fl. N. A. (1803).

P. spectabilis PURSH, Fl. Am. (1814).

Eragrostis spectabilis GRAY, Man. ed. I, 598 (1848).

E. pectinacea var. *spectabilis* GRAY l. c.

Poa hirsuta AUCT. AMER.

Wats. and Coult., Gray's Man. 6 ed. 661; Britt., Fl. N. J. 294; Webb., Fl. Neb. 102; Upham, Fl. Minn. 168; Chap., Fl. So. St. 564; Cov., Fl. Ark. 237.

North America: Mass. to N. J. and Fla.; W. to Minn., Neb. and Ark.

Minn. valley: Forest district; infrequent; sandy and barren places.

HERB.: *Ballard* 638, Chaska; *Sandberg* 582, Red Wing; *Oestlund* 332, Minneapolis.

Eragrostis purshii SCHRAD. Linn. XII, 45 (1838).

Poa tenella PURSH, Fl. Am. (1814).

P. caroliniana SPRENG. Mant. I, 33 (1828).

P. pectinacea AUCT. AMER. not of MICHX.

Wats. and Coult., Gray's Man. 6 ed. 661; Britt., Fl. N. J. 294; Webb., Fl. Neb. 102; Mac., Fl. Can. II, 219; Coult., Fl. Colo. 419; Chap., Fl. So. St. 563; Upham, Fl. Minn. 167; Wats., King Exp. 388; Roth., Wheel. Exp. 291; Cov., Fl. Ark. 237.

North America: Ont., Penn. and N. J. to N. Car.; W. to Minn., Dak., Neb., Colo., Nev., Ark. and N. Mex.

Minn. valley: Throughout; sandy places and banks of streams.

HERB.: *Ballard* 853, Page Lake, Carver Co.; *Leiberg* 97, Blue Earth Co.; *Sandberg* 580, Red Wing; *Sandberg* 581, Red Wing; *Leiberg* 98, Pipestone Quarry.

***Eragrostis eragrostis* (LINN.).**

Briza eragrostis LINN. Spec. 70 (1753).

Poa multiflora FORSK. Descr. 21 (1775):

P. cilianensis ALL. Fl. Ped. II, 246 (1785).

Briza oblonga MOENCH, Meth. 185 (1794).

Poa megastachya KOEL. Gram. 181 (1802).

P. eragrostis SM Prodr. I, 54 (1806).

Eragrostis major HOST. Gram. IV. 14 (1809).

Megastachya eragrostis BEAUV. Agr. 74 (1812).

Eragrostis megastachya LINK, Hort. Berol. I, 187 (1827).

E. vulgaris var. *megastachya* COSS. and GERM. Fl. Par. II, 641 (1845).

Poa oblonga BMG. Enum. III, 238 (1846).

Eragrostis poaeoides var. *megastachya* GRAY, Man. ed. V. 631 (1868).

E. multiflora ASCH. Cat. Serb. 10 (1877).

Wats. and Coult., Gray's Man. 6 ed. 660; Britt., Fl. N. J. 293; Mac., Fl. Can. II, 219; Webb., Fl. Neb. 101; Chap., Fl. So. St. 563; Upham, Fl. Minn. 167; Wats., Fl. Calif. II, 315; Vas., Ag. Grasses U. S. 61; Led., Fl. Ross. IV. 382; Richt., Pl. Eur. I, 73; Nym., Fl. Eur.; Wats., King Exp. 388; Roth., Wheel. Exp. 291; Cov., Fl. Ark. 237.

Middle Europe; S. Asia; Africa; cosmopolitan.

North America: Ont. to N. Eng., N. J. and Fla.; W. to Man., Minn., Neb., Ark.; also, Pac. coast to Oregon.

Minn. valley: Throughout; riverbanks, lake shores, roadsides and railway embankments.

HERB.: *Ballard* 839, Page Lake, Carver Co.; *Sheldon* 895, Sleepy Eye; *Sandberg* 579, Cannon Falls; *Oestlund* 334, Hennepin Co.

***Eragrostis hypnoides* (LAM.) B. S. P. Cat. N. Y. (1888).**

Poa hypnoides LAM. Ill. I, 185 (1791).

P. reptans MICHX. Fl. N. A. I. 69 (1803).

Megastachya reptans BEAUV. Agr. 74 (1812).

Eragrostis reptans NEES, Mart. Fl. Braz. I, 514 (1829).

Wats. and Coult., Gray's Man. 6 ed. 660; Upham, Fl. Minn. 167; Britt., Fl. N. J. 293; Webb., Fl. Neb. 102; Chap., Fl. So. St. 563; Mac., Fl. Can. II, 219; Wats., Fl. Calif. II, 314; Gris., Fl. W. I.; Cov., Fl. Ark. 237.

Trinidad to Buenos Ayres.

North America: Ont. to N. Eng., N. J., Fla.; W. to Man., Minn., Neb., Mo. and Ark.

Minn. valley: Throughout; frequent; riverbanks and lake shores.

HERB.: *Sheldon* 1207, New Ulm; *Sheldon* 1089, Springfield; *Ballard* 484, Prior's Lake, Scott Co.; *Sandberg* 578, Goodhue Co.

EATONIA RAF. Journ. Phys. LXXXIX. 104 (1819).

Reboulea KUNTH, Rev. Gram. 341 (1835).

Colobanthus TRIN. Mem. Acad. Petr. 6, II, 66 (1845).

Benth. and Hook., *Gen. Pl.* III. 1184; Engler and Prantl, *Nat. Pflanz.* 2, II, 70 (Hackel; Durand, *Ind. Gen. Phan.* 476).

Living species: 3; N. America. E. Sts., 3; Canada, 2; Rocky mts., 1; California, 1; S. Sts., 3; Pl. Wheel., 1; Pl. King., 1.

Eatonia obtusata (MICHX.) GRAY, Man. ed. V. 626 (1868).

Aira obtusata MICHX. Fl. N. Am. I, 62 (1803).

A. truncata MUHL. Gram. 83 (1817).

?*Reboulea gracilis* KUNTH, Enum. (1833).

Koeleria truncata TORR. Fl. N. Y. II, 469 (1843).

Reboulea obtusata GRAY, Man. ed. I, 591 (1848).

Wats. and Coult., Gray's Man. 6 ed. 659; Britt., Fl. N. J. 293; Webb., Fl. Neb. 102; Mac., Fl. Can. II, 218, 394; Coult., Fl. Colo. 419; Wats. Fl. Calif. II, 302; Chap., Fl. So. St. 560; Upham, Fl. Minn. 166; Engl., Hackel, Nat. Pflanz. II, 2, 70; Wats., King Exp. 383; Roth., Wheel. Exp. 289; Cov., Fl. Ark. 236.

North America: N. Penn. and N. J. to Fla.; W. to Lake Huron, Minn., Saskatchewan, Oregon and Arizona. S. to Ark. and N. Mex..

Minn. valley: Forest district and S. W.; dry soil and openings in forest.

HERB.: *Sheldon* 867, Sleepy Eye; *Leiberg* 96, Rock Co.

Eatonia pennsylvanica (DC.) GRAY, Man. ed. V, 626 (1868).

Koeleria (?) *pennsylvanica* DC. Cat. Monsp. (1813).

Aira mollis MUHL. Gram. 81 (1817).

A. triflora ELL. Sk. I, 154 (1821).

?*Reboulea gracilis* KUNTH, Enum. (1833).

E. pennsylvanica GRAY, Man. ed. I, 591 (1848).

Wats. and Coult., Gray's Man. 6 ed. 660; Britt., Fl. N. J. 293; Mac., Fl. Can. II, 218; Webb., Fl. Neb. 102; Upham, Fl. Minn. 166; Chap., Fl. So. St. 560; Engl., Hackel, Nat. Pflanz. II, 2, 70; Mac., Fl. Can. II, 2, 394; Cov., Fl. Ark. 236.

North America: N. Br. to Carolinas; W. to Man., Hudson Bay, Brit. Col. and Rocky mts.; S. to Neb., Nev., Ark. and Tenn.

Minn. valley: Forest district and S. W.; meadows and open, damp woodland.

HERB.: *Taylor* 658, Cobb river, Blue Earth Co.; *Bailey* 32, Vermilion lake.

KOELERIA PERS. Syn. I, 97 (1805).

Collinaria EHRH. Beitr IV 147 (1789).

Airochloa LINK, Hort. Berol. I, 126 (1827).

Lophochloa REICH. Fl. Germ. Exc. 42 (1830).

Ægialitis TRIN. Fund. Agr. 127 (1820).

Ægialina SCHULTES, Syst. Mant. II, 13, 222 (1824).

Wilhelmsia C. KOCH, Linn. XXI, 400 (1847).

Benth. and Hook., *Gen. Pl.* III, 1183; Durand, *Ind. Gen. Phan.* 476; Engler and Prantl, *Nat. Pflanz.* 2, II, 70 (Hackel).

Living species: 15; Europe, temp. Asia, N. Africa—1 of these, N. America, S. America and S. Africa. Principally in Europe; Europe, 16 (*Richter*); Russia, 4; 1 Patagonia, Sandwich Isls.; N. America, 1.

Koeleria cristata (LINN.) PERS. Syn. I, 97 (1805).

Aira cristata LINN. Spec. 63 (1753).

Festuca cristata VILL. Dauph. II, 93 (1787).

Poa pyramidata LAM. Ill. I, 183 (1791).

P. cristata WILLD. Spec. I, 402 (1797).

Melica gmelini ROTH. Tent. Germ. II, 104 (1797).

M. hirsuta KOEL. Gram. 144 (1802).

Dactylis cristata M. B. Fl. T. 1, 67 (1809).

Koeleria nitida NUTT. Gen. I, 74 (1818).

Koeleria arenaria DUM. Agr. 115 (1823).

K. parviflora BERT. Schultes Mant. II, 344 (1824).

Airochloa cristata LINK, Hort. Berol. I, 435 (1827).

Wats. and Coult., *Gray's Man.* 6 ed. 659; Upham, *Fl. Minn.* 166; Wats., *Fl. Calif.* II, 301; Coult., *Fl. Colo.* 418; Webb., *Fl. Neb.* 102; Vas., *Agr. Grasses U. S.* 60; Engl., *Hackel, Nat. Pflanz.* II, 2, 70; Richt., *Pl. Eur.* I, 74; Led., *Fl. Ross.* IV, 401; Nym., *Fl. Eur.*; Hook., *Fl. Gt. Brit.* 488; Trautv., *Fl. Sib.* 138; Wats., *King Exp.* 383; Cov., *Fl. Ark.* 236; Roth., *Wheel. Exp.* 288; Hart., *Fl. Scand.* I, 506.

All Europe; middle Russia to Caucasus mts. and Dahuria.

North America: Penn. to Ill., Neb., Kan., Ark.; N. W. to Dak., Minn., Saskatchewan, Athabasca; W. to Vancouver, Oregon and Calif.; R. mt. region.

Minn. valley: 'Throughout; abundant; dry hillsides, railway embankments and roadsides or meadows.

HERB.: *Sheldon* 756, Sleepy Eye; *Taylor* 656, Cobb river, Blue Earth Co.; *Taylor* 353, Janesville; *Taylor* 174, Janesville; *Ballard* 96, Shakopee; *Ballard* 254, Jordan, Scott Co.; *Ballard* 184, Jordan, Scott Co.; *MacM.* and *Sheld.* 57, Brainerd; *Sandberg* 568, Red Wing; *Herb. Sheld.* 1758, Minneapolis; *Sheldon* 1382, Lake Benton.

POA LINN. Gen. 55 (1737).*Leucopoa* GRISEB. Led., Fl. Ross. IV, 383 (1853).*Poidium* NEES, Lindl. Introd. Nat. Syst. ed. 2, 450 (1835).Benth. and Hook., *Gen. Pl.* III, 1196; Durand, *Ind. Gen. Phan.* 478; Engler and Prantl, *Nat. Pflanz.* 2, II, 73 (Hackel).

Living species: 100; cosmopolitan; tropical mts. Europe, 41; Russia, 25; N. America, 40; Canada, 29; Pl. King, 11; Pl. Wheel., 10; Rocky mts., 12; E. Sts., 10; S. Sts., 8; Calif., 10-11.

Poa nemoralis LINN. Spec. 69 (1753).*Festuca airoides* LAM. Enc. Meth. II, 464 (1786).*Poa cinerea* VILL. Dauph. II, 156 (1787).*P. debilis* THUILL. Fl. Par. 43 (1790).*P. nutans* GILIB. Exerc. Phyt. II, 532 (1792).*P. juncea* SUT. Fl. Helv. I, 46 (1802).*P. glaucantha* GAUD. Alp. III, 36 (1808).*P. gracilescens* SCHRAD. Hort. Gött. I (1809).*P. glauca* BAST. Ess. 39 (1809).*Aira elodes* BRIGN. Fl. For. 10 (1810).*Poa palustris* DC. Fl. Fr. VI, 272 (1815).*Catabrosa elodes* R. and S. Syst. II, 696 (1817).*Poa firmula* GAUD. Fl. Helv. I, 239 (1828).*P. caesia* AUCT. AMER., not Sm.*P. caesia* var. *strictior* GRAY, Man. ed. V, 628 (1868).

Wats. and Coult., Gray's Man. 6 ed. 664; Upham, Fl. Minn. 167; Mac., Fl. Can. II, 223, 225; Webb., Fl. Neb. 101; Coult., Fl. Colo. 421; Richt., Pl. Eur. I, 85; Led., Fl. Ross. IV, 374; Hook., Fl. Gt. Brit. 492; Nym., Fl. Eur.; Wats., King Exp. 386; Cov., Fl. Ark. 237; Hart., Fl. Scand. I, 498; Rothr., Alask. 458.

Arctic and Northern Europe to Mediterranean; Siberia to Himalayas.

North America: Greenland, Labrador, N. S. to Saskatchewan, N. W. T., Brit. Col. and Rockies; S. to Maine and Vt.; W. to Minn., Neb. and Colo. Ark. ? Alaska.

Minn. valley: Forest district; dry and open places; infrequent.

HERB.: *Bailey* 469, Agate Bay; *Bailey* 434, Basswood Lake; *Sandberg* 575, Red Wing; *Sandberg* 576, Red Wing.**Poa palustris** LINN. Syst. 874 (1759).*P. serotina* EHRH. Beitr. VI, 86 (1791).*P. riparia* WOLF. Hoffm., Fl. Dan. 42 (1791).*P. triflora* GILIB. Exerc. Phyt. II, 531 (1792).*P. fertilis* HOST. Gram. III, 10 (1805).*P. hydrophila* PERS. Syn. I, 89 (1805).*P. angustifolia* WAHL. Fl. Ups. 66 (1820).*P. exigua* DUM. Belg. Agr. 113 (1823).? *P. crocata* MICHX. Fl. N. Amer. I, 68 (1803).

? *P. effusa* KIT. Schultes, Ost. Fl. ed. 2, I, 227 (1814).

P. nemoralis PURSH, Fl. Am. (1814).

Wats. and Coult., Gray's Man. 6 ed. 665; Britt., Fl. N. J. 295; Webb., Fl. Neb. 101; Upham, Fl. Minn. 167; Mac., Fl. Can. II, 226; Coult., Fl. Colo. 442; Wats., Fl. Calif. II, 313; Vas., Ag. Grasses U. S. 67; Led., Fl. Ross. II, 375; Richt., Pl. Eur. I, 87; Wats., King Exp. 386; Roth., Wheel. Exp. 290.

Mid. and S. Europe; N. Africa; Asia Minor to Siberia and the Himalayas.

North America: N. S., Q., Ont. to N. J.; W. to Mich., Wisc., Minn., Man., Neb., Saskatchewan, Colo., Rocky mts. and Washington; N. to Vancouver and Athabasca.

Minn. valley: Throughout; meadows and edges of marshes and along streams.

HERB.: *Ballard* 328, Belle Plaine; *Ballard* 325, Belle Plaine; *Taylor* 227, Janesville; *Bailey* 510, Agate Bay; *Sandberg* 577, Red Wing; *Juni* 25, Agate Bay.

***Poa compressa* LINN.** Spec. 69 (1753).

P. muralis WIBB. Fl. Werth. 114 (1799).

P. anceps PR. Cyp. and Gram. 43 (1820).

P. planiculmis PR. Add. (1820).

P. polynoda and *subcompressa* PARN. Brit. Gras. 84 (1845).

P. complanata SCHUR. Enum. 770 (1866).

Wats. and Coult., Gray's Man. 6 ed. 664; Britt., Fl. N. J. 295; Mac., Fl. Can. II, 224; Coult., Fl. Colo. 421; Vas., Ag. Grasses U. S. 65; Webb., Fl. Neb. 101; Upham, Fl. Minn. 167; Chap., Fl. So. St. 563; Led., Fl. Ross. IV, 371; Richt., Pl. Eur. I, 88; Hook., Fl. Gt. Brit. 492; Nym., Fl. Eur.; Hart., Fl. Scand. I, 500.

Mid. and S. Europe; Siberia and Kamtk.

North America: Minn. to Neb. and Kan.; N. W. to Vancouver. Introd. E. and S.

Minn. valley: Forest district; infrequent; waste places.

HERB.: *Oestlund* 331, Minneapolis; *Oestlund* 332, Minneapolis; *Bailey* 527, Agate Bay.

SCOLOCHLOA LINK, Hort. Berol. I, 136 (1827).

Fluminia FRIES, Summ. Scand. Veg. 247 (1846).

Benth. and Hook., *Gen. Pl.* III, 1197 (*sub Graphephorum*); Durand, *Ind. Gen. Phan.* 478; Engler and Prantl, *Nat. Pflanz.* 2, II, 74 (Hackel).

Living species: 2; 1, N. temperate regions; 1, Saghalin.

Scolochloa arundinacea (LILJ.).

Festuca arundinacea LILJ. Sv. Fl. II, 47 (1792).

Arundo festucacea WILLD. Enum. I, 126 (1809).

Donax festucaceus BEAUV. Agr. 78 (1812).

Schenodorus arundinaceus R. and S. Syst. II, 700 (1817).

Donax borealis TRIN. Fund. Agrost. 156 (1820).

Festuca borealis M. K. Röhl., Dan. Fl. I, 664 (1823).

F. donacina WAHL. Fl. Suec. 64 (1824-26).

Scolochloa festucacea LINK, Hort. Berol. I, 137 (1827).

Triodia festucacea EICHW. Sk. 119 (1830).

Glyceria arundinacea FR. Nov. Mant. II, 8 (1832-42).

Fluminia arundinacea FR. Summ. I, 247 (1846-49).

Graphephorum festucaceum GRAY, Ann. Bot. Soc. Can. I, 57 (1861).

G. arundinaceum ASCH. Fl. Brand. 852 (1866).

Wats. and Coult., Gray's Man. 6 ed. 666; Mac., Fl. Can. II, 229; Upham, Fl. Minn. 165; Engl. Hackel, Nat. Pflanz. II, 2, 74; Richt., Pl. Eur. I, 89; Nym., Fl. Eur.; Led., Fl. Ross.; Hart., Fl. Scand. I, 505.

Northern Europe and Baikal Siberia.

North America: Lake of the Woods and Saskatchewan, throughout the prairie region and to the Peace river country; S. to Emmet Co., Iowa.

Minn. valley: W. and N. W. districts and S. edge; edges of lakes or streams.

HERB.: *Cratty* 5, Emmet Co., Iowa, state line.

PANICULARIA FABR. En. Pl. Helm. 373 (1763).

Glyceria R. BR. Prodr. 179 (1810).

Hydrochloa HARTM. Gram. Scand. 8 (1819).

Porroteranthe STEUD. Syn. Glum. I, 287 (1855).

Exydra ENDL. Fl. Posen. 119 (1830).

Benth. and Hook., *Gen. Pl.* III, 1197; Durand, *Ind. Gen. Phan.* 478; Engler and Prantl, *Nat. Pflanz.* 2, II, 74; O. Kuntze, *Rev. Gen.* II, 782.

Living species: 16; principally N. America; a few Europe and Asia; 1, Australia. Europe, 9-10; Russia, 6; North America, 15; Canada, 14; California, 3-4; Rocky mts, 4; Pl. Wheel., 4; E. Sts., 8; S. Sts., 4; Pl. King, 3.

Panicularia fluitans (LINN.) OK. Rev. Gen. II, 782 (1891).

Festuca fluitans LINN. Spec. 75 (1753).

Hydrochloa fluitans HOST. Gram. I, 141 (1801).

Poa fluitans KOEL. Gram. 204 (1802).

Glyceria fluitans R. BR. Prodr. I, 179 (1810).

Wats. and Coult., Gray's Man. 6 ed. 667; Britt., Fl. N. J. 296; Wats., Fl. Calif. II, 307; Vas., Agr. Grasses U. S. 70; Upham, Fl. Minn. 167; Chap., Fl. So. St. 561; Engl. Hackel, Nat. Pflanz. II, 2, 74; Richt., Pl. Eur. I, 90; Led., Fl. Ross. IV, 394; Hook., Fl. Gt. Brit. 494; Cov., Fl. Ark. 237; Hart., Fl. Scand. I, 501.

Cosmopolitan—Europe, Asia, Africa, Australia.

North America: N. Br., Q., Ont. to Saskatchewan, Brit. Col., Vancouver; S. to Oregon and Sierra Nevada; E. to Minn., Ark., Tenn. and Atl. coast.

Minn. valley: Forest district; shallow water of ponds or sluggish streams.

HERB.: *Bailey* 20, Vermilion Lake; *Sandberg* 573, Center City.

***Panicularia americana* (TORR.).**

Poa aquatica var. *americana* TORR. Fl. U. S. I, 108 (1824).

Glyceria arundinacea KUNTH, Enum. I, 367 (1833).

G. aquatica HOOK. Fl. Bor.-Am. II, 248 (1840).

G. grandis WATS. in W. and C. Gray's Man. ed. VI, 667 (1890).

Panicularia aquatica OK. Rev. Gen. II, 782 (1891).

Wats. and Coult., Gray's Man. 6 ed. 667; Vas., Ag. Grasses U. S. 69; Upham, Fl. Minn. 166; Mac., Fl. Can. II, 230; Britt., Fl. N. J. 296; Webb., Fl. Neb. 101; Coult., Fl. Colo. 423; Upham, Fl. Minn. 167; Wats., King Exp. 384; Rothr., Alask. 458.

North America: N. Br., Q., Ont. to N. Eng., N. Y. and N. J.; W. to Minn., Iowa, Neb., Colo., California; N. to Saskatchewan, Brit. Col., Vancouver and Sitka, Alaska; S. to Arizona?

Minn. valley: Forest district and probably throughout; wet grounds and meadows along streams.

HERB.: *Sheldon* 480, Madison Lake, Blue Earth Co.; *Ballard* 124, Chaska, Carver Co.; *Ballard* 317, Belle Plaine; *Oestlund* 330, Minneapolis; *Oestlund* 331, Minneapolis; *Sandberg* 572, Red Wing; *Bailey* 97, Vermilion lake; *Bailey* 263, St. Louis river; *Ballard* 250, Jordan, Scott Co.; *Ballard* 267, Jordan, Scott Co.

***Panicularia nervata* (WILLD.) OK. Rev. Gen. II, 783 (1891).**

Poa nervata WILLD. Spec. I, 389 (1797).

P. striata MICHX. Fl. N. Am. I, 69 (1803).

P. lineata PERS. Syn. I, 89 (1805).

P. parviflora PURSH, Fl. Am. I, 80 (1814).

Briza canadensis NUTT. Gen. I, 69 (1818).

Glyceria michauxii KUNTH, Enum. 367 (1833).

G. nervata TRIN. Act. Petrop. ser. 6, I, 365 (1836).

Wats. and Coult., Gray's Man. 6 ed. 667; Britt., Fl. N. J. 296; Mac., Fl. Can. II, 232; Vas., Ag. Grasses U. S. 70; Upham, Fl. Minn. 166; Webb., Fl. Neb. 101; Chap., Fl. So. St. 561; Wats., Fl. Calif. II, 307; Coult., Fl. Colo. 423; Richt., Pl. Eur. I, 90; Roth., Wheel. Exp. 289; Cov., Fl. Ark. 237.

Introduced in France.

North America: N. S., N. Br., Q., Ont. to W. Fla.; W. to Athabasca, Peace river, Vancouver, Brit. Col., Oregon, Calif., Nev. and Arizona.

Minn. valley: Throughout; abundant; moist or marshy fields and meadows or wet places in open woodland.

HERB.: *Sheldon* 553, Rice lake, Waseca Co.; *Ballard* 59, Chaska; *Sheldon* 955, Redwood Falls; *Sheldon* 455, Duck lake, Blue Earth Co.; *Bailey* 349, Mud river; *Bailey* 103, Ver-

milion lake; *Sandberg* 570, Red Wing; *Sandberg* 571, Chisago Co.

***Panicularia elongata* (TORR.) OK.** Rev. Gen. II, 783 (1891).

Poa elongata TORR. Fl. U. S. I, 112 (1824).

Glyceria elongata TRIN. Act. Petrop. ser. 6, I, 365 (1836).

Wats. and Coult., Gray's Man. 6 ed. 667; Britt., Fl. N. J. 296; Mac., Fl. Can. II, 231; Upham, Fl. Minn. 166.

North America: N. Br., Q. to N. Eng., N. J., Penn. and mts. of N. Car.; W. in U. S. to Mich. and Minn.

Minn. valley: Forest district; Ft. Snelling to Blue Earth Co.; rare; damp, marshy places in woods.

***Panicularia canadensis* (MICHX.) OK.** Rev. Gen. II, 783 (1891).

Briza canadensis MICHX. Fl. N. Am. I, 71 (1803).

Poa canadensis BEAUV. Agrost. 155 (1812).

Megastachya canadensis R. and S. Syst. II, 593 (1817).

Glyceria canadensis TRIN. Act. Petrop. ser. 6, I, 366 (1836).

Wats. and Coult., Gray's Man. 6 ed. 667; Britt., Fl. N. J. 295; Upham, Fl. Minn. 166; Mac., Fl. Can. II, 230; Vas., Ag. Grasses U. S. 69.

North America: N. S., N. Br., Q., Ont. to Georgian Bay and L. Nipigon; S. to N. J. and Penn.; W. to Minn., Neb. and Kan.

Minn. valley: N. E. districts and N. edge; marshes and edges of lakes.

HERB.: *Sheldon* 1630, Taylors Falls; *MacM. and Sheld.* 14, Cass Co.; *Bailey* 264, St. Louis river; *Bailey* 273, St. Louis river; *Sandberg* 569, Chisago Co.

FESTUCA LINN. Gen. 41 (1737).

***Vulpia* GMEL.** Fl. Bad. I, 8 (1805).

***Mygalurus* LINK,** Hort. Berol. I, 92 (1827).

***Loretia* DUR.** Jour. Rev. Sci. Nat. II, 2, 38 (1874).

***Helleria* FOURN.** Gram. Mex. 128 (1880).

***Schedonorus* BEAUV.** Agrostogr. 99 (1812).

***Amphigene* JANKA,** Linn. XXX, 619 (1856).

***Catapodium* LINK,** Hort. Berol. I, 44 (1827).

***Micropyrum* and *Festucaria* LINK,** Linn. XVII, 397-398 (1843).

***Nardurus* REICH.** Godr. Fl. Lorr. ed. 2, II, 458 (1857).

***Castellia* TIN.** Pl. Rar. Sic. 17 (1846).

***Sclerochloa* REICH.** Ic. Fl. Germ. t. 58 (1834).

***Scleropoa* GRISEB.** Spic. Rum. II, 431 (1845).

Benth. and Hook., Gen. Pl. III, 1198; Durand, Ind. Gen. Phan. 478; Engler and Prantl, Nat. Pflanz. 2, II, 74 (Hackel).

Living species: 85; 250 described; temperate and tropical (rarely) regions. 129 (Richter), Europe; N. America, 16; Canada, 14; California, 7-8; E. Sts., 3; S. Sts., 8-10; Rocky mts., 4-5; Pl. King, 4; Pl. Wheel., 4.

Festuca nutans WILLD. Enum. I, 116 (1809).*Poa nutans* LINK, Hort. Berol. (1827).

Wats. and Coult., Gray's Man. 6 ed. 669; Webb., Fl. Neb. 100; Britt., Fl. N. J. 297; Mac., Fl. Can. II, 234; Chap., Fl. S. St. 565; Upham, Fl. Minn. 168; Cov., Fl. Ark. 238.

North America: N. S. to Ont., N. Eng., N. J. and Fla.; W. to Minn., Neb., Dak. and Mo.

Minn. valley: Forest district and N. W.; rather rare; woods and thickets, sterile soil.

HERB.: *Ballard* 387, Jordan, Scott Co.; *Ballard* 528, Cleary's lake, Scott Co.; *Ballard* 130, Chaska; *Sandberg* 583, Chisago Co.; *Ballard* 222, Jordan, Scott Co.

Festuca ovina LINN. Spec. 73 (1753).*Bromus ovinus* SCOP. Fl. Carn. I, 77 (1772).*Festuca nigra* GILIB. Exerc. Phyt. II, 533 (1792).

Wats. and Coult., Gray's Man. 6 ed. 669; Britt., Fl. N. J. 297; Mac., Fl. Can. II, 235; Wats., Fl. Calif. II, 317; Coult., Fl. Colo. 424; Webb., Fl. Neb. 100; Upham, Fl. Minn. 168; Engl. Hackel, Nat. Pflanz. II, 2, 75; Richt., Fl. Eur. I, 93; Nym., Fl. Eur.; Led., Fl. Ross. IV, 350; Hook., Fl. Gt. Brit. 497; Trautv., Fl. Sib. 134; Miyabe, Fl. Kur. 271; Wats., King Exp. 389; Roth., Wheel. Exp. 32, 291, 292; Hart., Fl. Scand. I, 491; Rothr., Alask. 458.

Cosmopolitan.

North America: N. S., Q., Ont., Man. to Saskatchewan, Bear Lake, 62° N. lat., Vancouver; S. to Fla., N. Mex. and Mexico.

Minn. valley: Forest district; frequent; fields and meadows.

HERB.: *Ballard* 240, Jordan, Scott Co.; *Ballard* 282, Jordan, Scott Co.; *Leiberg* 99, Blue Earth Co.; *Bailey* 489, Agate Bay; *Bailey* 450, Mud lake.

Festuca octoflora WALT. Fl. Car. 81 (1788).*F. bromoides* MICHX. Fl. N. A. I, 66 (1803).*F. tenella* WILLD. Enum. I, 113 (1809).*Schoenodorus tenellus* R. and S. Syst. II, 727 (1817).

Wats. and Coult., Gray's Man. 6 ed. 669; Mac., Fl. Can. II, 237; Wats., Fl. Calif. II, 317; Britt., Fl. N. J. 296; Chap., Fl. S. St. 565; Webb., Fl. Neb. 100; Upham, Fl. Minn. 168; Coult., Fl. Colo. 424; Roth, Wheel. Exp. 292; Wats., King Exp. 388; Cov., Fl. Ark. 238.

North America: Q. to Brit. Col. and Vancouver; S. to Fla., Tex. and Mex.

Minn. valley: Reported from forest district and probably W. to Chippewa river; dry or waste places.

BROMUS LINN. Gen. 40 (1737).**Schedonorus** BEAUV. Agrostogr. 99 (1812).**Anisantha** C. KOCH, Linn. XXI, 394 (1847).

Serrafalcus PARLAT. Pl. Nov. 75 (1842).

Libertia LEJEUNE, Nov. Act. Cur. XII, 755 (—).

Michelaria DUM. Agrostogr. Belg. 77 (1823).

Triniusia STEUD. Syn. Glum. I, 328 (1855).

Ceratochloa BEAUV. Agrostogr. 75 (1812).

Benth. and Hook., *Gen. Pl.* III, 1200; Durand, *Ind. Gen. Phan.* 478; Engler and Prantl, *Nat. Pflanz.* 2, II, 75 (Hackel).

Living species: 40; cosmopolitan; especially in N. temperate regions; a few in tropical mts. and in the S. hemisphere. Europe, 42 (*Richter*); N. America, 12; Canada, 10; California, 6; S. Sts., 4; Rocky mts., 3; E. Sts., 2; Pl. Wheel., 2; Pl. King., 2.

Bromus purgans LINN. Spec. 76 (1753).

B. ciliatus var. *purgans* GRAY, Man. ed. I, 600 (1848).

Wats. and Coult., Gray's Man. 6 ed. 670; Britt., Fl. N. J. 297; Chap., Fl. S. St. 566; Upham, Fl. Minn. 168; Led., Fl. Ross. IV. 361? Cov., Fl. Ark. 238; Webb., Appx. Neb. 25.

Kamtschatka and S. America?

North America: N. Eng., to Fla.; W. to Minn., Dak. and Neb.

Minn. valley: Throughout; abundant; river banks, shores of lakes and woodlands.

HERB.: *Ballard* 214, Jordan, Scott Co.; *Ballard* 707, Waconia; *Sheldon* 1594, Lake Benton; *Sheldon* 1307, Lake Benton; *Sheldon* 902, Sleepy Eye; *Sheldon* 558, Waseca; *Sheldon* 1193, New Ulm; *Ballard* 509, Prior's Lake, Scott Co.; *MacM.* and *Sheld.* 60, Brainerd; *Sandberg* 586, Red Wing; *Oestlund* 385, Minneapolis.

Bromus ciliatus LINN. Spec. 76 (1753).

B. canadensis MICHX. Fl. N. Am. I, 65 (1803).

B. pubescens var. 1, TORR. Fl. U. S. I, 129 (1824).

B. purgans HOOK. Fl. Bor. Am. I, 252 (1833), *in part*.

B. inermis var. *ciliata* TRAUTV. Act. Hort. Petrop. V, I, 135 (1877).

Wats. and Coult., Gray's Man. 6 ed. 670; Britt., Fl. N. J. 297; Webb., Fl. Neb. 100; Upham, Fl. Minn. 168; Mac., Fl. Can. II, 237; Coult., Fl. Colo. 425; Wats., Fl. Calif. II, 320; Vas., Ag. Grasses U. S. 74; Led., Fl. Ross. IV, 358; Wats., King Exp. 390; Roth, Wheel. Exp. 292; Cov., Fl. Ark. 238; Rothr., Alask. 458.

North America: N. S., N. Br., Q., Ont., Man., Brit. Col., Vancouver to Kotzebue Sound, Alaska; S. to N. Eng., N. J. and Va.; W. to Minn., Mo., Neb., Colo. and Calif.

Minn. valley: Throughout; woods, banks of streams and shores of lakes.

HERB.: *Ballard* 717, Benton, Carver Co.; *Taylor* 1189, Glenwood; *Ballard* 846, Page Lake, Carver Co.; *Ballard* 579,

Crystal Lake, Scott Co.; *MacM.* and *Sheld.* 58, Brainerd; *Bailey* 5, Vermilion Lake; *Sandberg* 585, Red Wing; *Herb. Sheld* 1649, Minneapolis,

Bromus kalmii GRAY, *Man.* ed. I, 600 (1848).

B. ciliatus LINN. in herb. not spec.

B. purgans TORR. *Fl. N. Y.* II, 463 (1843), *in part.*

Wats. and Coult., *Gray's Man.* 6 ed. 670; Britt., *Fl. N. J.* 297; Coult., *Fl. Colo.* 425; Mac., *Fl. Can.* II, 233; Webb., *Fl. Neb.* 100; Upham, *Fl. Minn.* 168.

North America: Ont., Ott. and Man.; S. to N. Eng., N. J., Penn.; W. to Minn., Neb., Dak. and Mo.

Minn. valley: Forest district; dry places, fields and meadows.

HERB.: *MacM.* and *Sheld.* 59, Brainerd; *Sandberg* 584, Red Wing; *Leiberg* 100, Blue Earth Co.

AGROPYRUM J. GAERTN. ex. Beauv. *Agrost.* 101 (1812).

Elytrigia DESVX. *Bull. Philom.* II, 190 (1810).

Roegneria C. KOCH, *Linn.* XXI, 413 (1847).

Anthosachne STEUD. *Syn. Glum.* I, 237 (1855).

Eremopyrum LED. *Fl. Alt.* I, 112 (1829).

Costia WILLK. *Bot. Zeit.* 377 (1858).

Cremopyrum SCHUR. *Transsylv.* 807 (1866).

Haynaldia SCHUR. l. c. 807 (1866).

Heteranthelium HOCHST. *Jaub. et Spach, Ill. Or.* IV, 24 (1855).

Benth. and Hook., *Gen. Pl.* III, 1202; Durand, *Ind. Gen. Phan.* 479; Engler and Prantl, *Nat. Pflanz.* 2, II, 78 (Hackel).

Living species: 34; temperate regions. Europe 32; (*Richter*); N. America, 10; Canada, 6; Rocky mts., 5; California, 4; E. Sts., 5.

Agropyrum caninum (LINN.) R. and S. *Syst.* II, 756 (1817).

Triticum caninum LINN. *Spec.* 86 (1753).

Elymus caninus LINN. *Fl. Suec.* ed. II, 112 (1755).

Triticum sepium LAM. *Enc. Meth.* II, 563 (1786).

Festuca nutans MOENCH, *Meth.* 191 (1794).

Bracconotia elymoides GODR. *Fl. Lorr.* III, 193 (1844).

Wats. and Coult., *Gray's Man.* 6 ed. 672; Mac, *Fl. Can.* II, 241; Britt., *Fl. N. J.* 298; Wats., *Fl. Calif.* II, 324; Coult., *Fl. Colo.* 426; Upham, *Fl. Minn.* 169; Richt., *Pl. Eur.* I, 123; Hook., *Fl. Gt. Brit.* 503.

Europe; Siberia; Himalayas.

North America: N. Br., Q., Ont., Saskatchewan, Brit. Col. and Rocky mts.; S. to N. Eng. and N. J.; W. to Minn., Colo., Nev. and Calif.

Minn. valley: Probably throughout; principally in forest district; waste or dry places.

HERB.: *Bailey* 42, Vermilion lake.

Agropyrum violaceum (HORN.) LANGE. ex. Richt. Pl. Eur. I, 123 (1890).

Triticum violaceum HORN. Fl. Dan. 2044 (1827?).

Wats. and Coult., Gray's Man. 6 ed. 672; Mac., Fl. Can. II, 243; Coult., Fl. Colo., 426; Wats., Fl. Calif. II, 324; Upham, Fl. Minn. 169; Richt., Pl. Eur. I, 123.

N. Scandinavia.

North America; Q., Man., Assiniboia to Rockies, N. W. T. and Grinnell Land—81° 44' N. lat.; Greenland; S. to N. Eng. and mts. of N. Y.; W. to Lake Superior region, Minn. and Dak.

Minn. valley: Throughout; forest openings and railway embankments; infrequent.

HERB.: *Sheldon* 979, Sleepy Eye; *MacM.* and *Sheld.* 2, Brainerd; *Bailey* 494 Agate Bay.

Agropyrum glaucum (DESF.) R. and S. var. **occidentale** VAS. and SCRIB.

A. repens AUCT. in part.

Triticum repens var. *glaucum* VAS. Cat. (1885).

Wats. and Coult., Gray's Man. 6 ed. 671; Britt., Fl. N. J. 298; Webb., Fl. Neb. 100; Coult., Fl. Colo. 425; Wats., Fl. Calif. II, 323; Vas., Ag. Grasses U. S. 75; Mac., Fl. Can. II, 242; Upham, Fl. Minn. 169; Engl. Hackel, Nat. Pflanz. II, 2, 79; Richt., Pl. Eur. I, 123 (spec.); Hook., Fl. Gt. Brit. 504 (spec.); Led., Fl. Ross. IV, 340 (spec.); Trautv., Fl. Sib. 133 (spec.).

Species in Europe and Asia.

North America: N. S., Q., Ont. to Man., Brit. Col. and Arctic sea?; S. to N. J. and Va.; W. to Cal., Oregon and Utah.

Minn. valley: Throughout; fields and sterile places.

HERB.: *Ballard* 316, Belle Plaine; *Sheldon* 1377, Lake Benton; *Sheldon* 463, Madison Lake, Blue Earth Co.; *MacM.* and *Sheld.* 17, Brainerd; *Bailey* 511, Agate Bay; *Sandberg* 587, Red Wing; 588, Red Wing.

HORDEUM LINN. Gen. 45 (1737).

Critho E. MEY. Ind. Hort. Regiom. (1848).

Zeocriton BEAUV. Agrostogr. 114 (1812).

Critesion RAF. Journ. Phys. LXXXIX, 103 (1819).

Crithopsis JAUB. et SPACH, Ill. Or. IV, 30 (1855).

Cuviera KOEL. Gram. Gall. et Germ. 328 (1802).

Benth. and Hook., *Gen. Pl.* III, 1206; Durand, *Ind. Gen. Phan.* 480; Engler and Prantl, *Nat. Pflanz.* 2, II, 86 (Hackel).

Living species: 16; temperate Asia, Europe, N. Africa, N. and S. America. Europe, 10; N. America, 5; Canada 3; California, 3; E. Sts., 2; Rocky mts., 2; S. Sts., 1; Pl. King, 3; Pl. Wheel., 2.

Hordeum nodosum LINN. Spec. ed. 2, 126 (1762).*H. murinum* var. *B.* LINN. Spec. 85 (1753)*H. secalinum* SCHREB. Spic. 148 (1771).*H. pratense* HUDS. Fl. Angl. ed. 2, 56 (1778).*Zeocriton secalinum* BEAUV. Agr. 115 (1812).*Hordeum pusillum* NUTT. Gen. I, 87 (1818).*H. pratense* var. *nodosum* LED. Fl. Ross. IV, 329 (1853).

Wats. and Coult., Gray's Man. 6 ed. 672; Webb., Fl. Neb. 99; Coult., Fl. Colo. 426; Mac., Fl. Can. II. 244; Wats., Fl. Calif. II, 325; Upham, Fl. Minn. 169; Vas., Ag. Grasses U. S. 77; Richt., Pl. Eur. I, 131; Chap., Suppl. S. St. 664; Roth, Wheel. Exp. 293; Wats., King Exp. 391; Rothr., Alask. 458.

Europe and Asia; cosmopolitan.

North America: Ohio, Ill., Minn., Neb. to Nev., Colo., Utah, Calif., Oregon; N. to Vancouver; S. to Tex.

Minn. valley: Reported from S. central district; rare or local.

Hordeum jubatum LINN. Spec. 85 (1753).*Critesium geniculatum* RAF. Jour. Phys. 103 (1819).

Wats. and Coult., Gray's Man. 6 ed. 672; Britt., Fl. N. J. 298; Webb., Fl. Neb. 99; Upham, Fl. Minn. 169; Wats., Fl. Calif. II, 325; Mac., Fl. Can. II, 243; Vas., Ag. Grasses U. S. 76; Coult., Fl. Colo. 427; Richt., Pl. Eur. I, 131; Trautv., Fl. Sib. 132; Led., Fl. Ross. IV, 329; Roth., Wheel. Exp. 293; Wats., King Exp. 390; Cov., Fl. Ark. 238.

Europe—S. Russia; E. Siberia.

North America: N. S., Q., Ont., Ott., Saskatchewan, Athabasca, Peace river, Vancouver, Brit. Col.; N. to Mackenzie and Yukon regions; S. to Gt. Lakes, Minn., Neb. and Colo.

Minn. valley: Throughout; abundant; waste or sandy places.

HERB.: *Sheldon* 176, Madison Lake, Blue Earth Co.; *Ballard* 155, Chaska; *Foote* 6, Worthington; *Oestlund* 336, Minneapolis; *Kassube* 274, Minneapolis; *Bailey* 128, Vermilion lake; *Sandberg* 589, Red Wing; *Herb. Sheld.* 1801, Minneapolis.

ELYMUS LINN. Gen. ed. V, 91 (1754).**Sitanion** RAF. Journ. Phys. LXXXIX, 103 (1819).**Polyantherix** NEES, Ann. Nat. Hist. I, 1, 284 (1838).

Benth. and Hook., *Gen. Pl.* III, 1206; Durand, *Ind. Gen. Phan.* 480; Engler and Prantl, *Nat. Pflanz.* 2, II, 88 (Hackel).

Living species: 30; temperate regions, except Australia and S. Africa. Europe, 4; N. America, 15; Canada, 12-13; E. Sts., 6; California, 5-6; Rocky mts., 4; S. Sts., 3; Pl. King, 2; Pl. Wheel., 4.

Elymus elymoides (RAF.) SWEEZEY, Cat. Neb. Pl. (1891).*Aegilops hystrix* NUTT. Gen. I, 86 (1818).*Sitanion elymoides* RAF. Jour. Phys. LXXXIX, 103 (1819).

Polyantherix hystrix NEES, Mart. Bras. (1829).

Elymus situnion R. and S. Mant. II, 426 (1824).

E. hystrix. per legem not Linn.

Wats. and Coult., Gray's Man. 6 ed. 673; Upham, Fl. Minn. 170; Wats., Fl. Calif. II, 327; Coult., Fl. Colo. 427; Roth., Wheel. Exp. 293, 377; Wats., King Exp. 391; Webb., Appx. Neb. 24.

North America: Oregon to San Diego, Calif.; E. to Minn., Neb., Ark., Arizona, Tex. and N. Mex.

Minn. valley: Reported from S. central district and westward; infrequent; river banks and wooded hills.

***Elymus striatus* WILLD. Spec. I (1797).**

E. villosus MUHL. Willd. Enum. 131 (1809).

E. striatus var. *villosus* GRAY, Man. ed. V, 639 (1868).

Wats. and Coult., Gray's Man. 6 ed. 673; Britt., Fl. N. J. 299; Mac., Fl. Can. II, 247; Upham, Fl. Minn. 170; Webb., Fl. Neb. 99; Chap., Fl. S. St. 567; Cov., Fl. Ark. 238.

North America: Ont. to N. Y., N. J. and N. Car.; W. to Minn., Neb. and Ark.

Minn. valley: Throughout; infrequent; roadsides and banks.

HERB.: *Sheldon* 842, Sleepy Eye; *Herb. Sheld.* 1647, Hennepin Co.

***Elymus canadensis* LINN. Spec. 83 (1753).**

E. philadelphicus LINN. Amoen. Acad. IV, 266 (1759).

E. glaucifolius WILLD. Enum. I, 131 (1809).

E. canadensis var. *glaucifolius* TORR. Fl. Am. I, 137 (1824).

Wats. and Coult., Gray's Man. 6 ed. 673; Britt., Fl. N. J. 298; Mac., Fl. Can. II, 245; Coult., Fl. Colo. 427; Webb., Fl. Neb. 99; Vas., Ag. Grasses U. S. 77; Upham, Fl. Minn. 169; Wats., Fl. Calif. II, 327; Chap., Suppl. S. St. 664; Roth., Wheel. Exp. 293; Cov., Fl. Ark. 238.

North America: N. S., Q., Ont., Man., Assiniboia to Rocky mts., Brit. Col. and Oregon; S. to N. Eng., N. J. and mts. of Ga.; W. to Minn., Neb., Colo., Tex. and N. Mex.

Minn. valley: Throughout; abundant; roadsides and banks.

HERB.: *Sheldon* 1120, Springfield; *Sheldon* 976½, Sleepy Eye; *Taylor* 762, Glenwood; *Ballard* 389, Jordan, Scott Co.; *Ballard* 578, Crystal lake, Scott Co.; *Ballard* 765, Waconia [(var. *glaucifolius* (Willd.))]; *Sandberg* 591, Red Wing; *Oestlund* 338, 339, Minneapolis.

***Elymus virginicus* LINN. Spec. 83 (1753).**

Wats. and Coult., Gray's Man. 6 ed. 673; Mac., Fl. Can. II, 247; Webb., Fl. Neb. 99; Chap., Fl. S. St. 567; Upham, Fl. Minn. 169; Britt., Fl. N. J. 298; Vas., Ag. Grasses U. S. 77; Cov., Fl. Ark. 238.

North America: N. S., N. Br., Q., Ont., L. Superior region to Man.; S. to N. Eng., N. J. and Fla.; W. to Minn., Neb., Kan., Mo. and Ark.

Minn. valley: Throughout; infrequent; banks of streams and lakes.

HERB.: *Foot* 7, Worthington; *Sandberg* 590, Red Wing; *Oestlund* 337, Minneapolis; *Bailey* 265, St. Louis river; *Sheldon* 1375, Lake Benton [(*forma minor* (Vas.))].

HYSTRIX MOENCH, Meth. 294 (1794).

Asprella WILLD. Enum. 132 (1809).

Gymnostichum SCHREB. Besch. Gräs. II, 127 (1772).

Benth. and Hook., *Gen. Pl.* III, 1207; Durand, *Ind. Gen. Phan.* 280; Engler and Prantl, *Nat. Pflanz.* 2, II, 88 (Hackel); O. Kuntze, *Rev. Gen.* II, 777.

Living species: 4; N. America, 2; Siberia, 1; New Zealand, 1. N. America,—California, 1; Atl. states, 1.

Hystrix hystrix (LINN.).

Elymus hystrix LINN. Spec. ed. 2, 124 (1762).

Gymnostichum hystrix SCHREB. Gräs. 47 (1769).

Hystrix patula MOENCH, Meth. (1794).

Asprella hystrix WILLD. Enum. I, 132 (1809).

A. angustifolia NUTT. Trans. Am. Phil. Soc. ser. 5, 151 (—).

Wats. and Coult., Gray's Man. 6 ed. 674; Upham, Fl. Minn. 170; Britt., Fl. N. J. 299; Chap., Fl. S. St. 567; Mac., Fl. Can. II, 248; Cov., Fl. Ark. 238; Webb., Appx. Neb. 24.

North America: N. Br., Q., Ont., Man. and Saskatchewan; S. to N. Y., N. J. and Ga.; W. to Minn., Dak., Neb., Ill. and Ark.

· Minn. valley: Throughout, particularly forest district; woods.

HERB.: *Sheldon* 459, Madison Lake, Blue Earth Co.; *Ballard* 128, Chaska; *Sandberg* 592, Red Wing; 593, Chisago Co.; 594, Red Wing.

IX. CYPERACEAE. Sedge Family.

Endlicher, *Gen. Pl.* 109 (1840); Benth. and Hook. *Gen. Pl.* III, 1037 (1883); Pax in Engler and Prantl, *Nat. Pflanz.* 2, II, 98 (1887).

Genera: 65; cosmopolitan; extinct, 1–2.

Species: 3000; living; 3–4 ? extinct.

HEMICARPHA NEES, Edin. Phil. Journ. XVII, 263 (1834).

Benth. and Hook., *Gen. Pl.* III, 1053; Durand, *Ind. Gen. Phan.* 458; Engler and Prantl, *Nat. Pflanz.* 2, II, 105 (Pax).

Living species: 3; 1 widely distributed in tropical and subtropical regions; 1, California; 1, Atl. N. America, Mexico and Brazil.

Hemicarpha micrantha (VAHL) BRITT. Cat. N. J. 266 (1890).*Isolepis micrantha* VAHL, Enum. (1806).*Scirpus subsquarrosus* MUHL. Gram. 39 (1817).*Hemicarpha subsquarrosa* MART. Fl. Brazil II, 61 (1842).

Wats. and Coult., Gray's Man. 6 ed. 583; Upham, Fl. Minn. 150; Coult., Fl. Colo. 368; Wats., Fl. Calif. II, 220; Chap., Fl. S. St. 513; Roth., Wheel. Exp. 275; Cov., Fl. Ark. 230; Webb., Appx. Neb. 24.

Brazil and Central America.

North America: N. Eng., N. J. to Fla.; W. to Minn., Colo., Calif. and Arizona.

Minn. valley: Forest district; Ft. Snelling to Blue Earth Co.; probably infrequent; sandy lake-beaches.

HERB.: *Leiberg* 78, Le Sueur river, Blue Earth Co.**DULICHIMUM** PERS. Syn. I, 65 (1805).

Benth. and Hook., *Gen. Pl.* III, 1046; Durand, *Ind. Gen. Phan.* 456; Engler and Prantl, *Nat. Pflanz.* 2, II, 107 (Pax).

Living species: 1; N. America, Atlantic states.

Dulichium spathaceum (LINN.) PERS. Syn. I, 65 (1805).*Schoenus spathaceus* LINN. Spec. ed. 2, 63 (1762).*Cyperus spathaceus* LINN. Syst. 84 (1774).*Scirpus spathaceus* MICHX. Fl. N. Am. I, 32 (1803).*Schoenus angustifolius* VAHL, Enum. II, 225 (1806).*Dulichium canadense* PURSH, Fl. Am. I, 54 (1814).

Wats. and Coult., Gray's Man. 6 ed. 573; Britt., Fl. N. J. 262; Mac., Fl. Can. II, 94; Upham, Fl. Minn. 150; Chap., Fl. S. St. 513; Engl. Pax, Nat. Pflanz. II, 2, 107; Cov., Fl. Ark. 229; Webb., Appx. Neb. 24.

North America: N. S., N. Br., Saskatchewan and Vancouver; S. to N. J. and Fla.; W. to Minn., Neb. and Tex.

Minn. valley: Forest district and N. edge; possibly S. W.; edges of lakes and marshes.

HERB.: *Ballard* 833, Patterson lake, Carver Co.; *Ballard* 815, Page lake, Carver Co.; *Ballard* 775, Swan lake, Carver Co.; *MacM. and Sheld.* 16, Brainerd; *Sandberg* 513, "Minnesota"; *Herrick* 322, Minneapolis; *Leiberg* 77, Blue Earth Co.

CYPERUS LINN. Gen. 33 (1737).**Bobartia** LINN. Zeyl. 17 (1747).**Mariscus** VAHL, Enum. II, 372 (1806).**Opetiola** GAERTN. Fruct. I, 14 (1788).**Adupla** BOSC. Jaume St. Hil. Expos. Fam. Nat. I, 65 (1805).**Pycreus** BEAUV. Fl. Ow. and Ben. II, 48 (1807).**Torreyia** and **Distimus** RAF. Jour. Phys. LXXXIX, 105 (1819).**Anosporum** and **Dichostylis** NEES, Linn. IX, 287, 289 (1835).**Trentepohlia** BOECKL. Bot. Zeit. 249 (1858).**Sorostachys** and **Atomostylis** STEUD. Syn. Glum. II, 315 (1855).

Galilea PARLAT. Palerm. I, 297 (1845).

Papyrus WILLD. Abh. Ac. Wiss. Berl. 70 (1812-13).

Borobora STEUD. Syn. Glum. II, 71 (1855).

Hydroschoenus ZOLL. ET MORR. Verz. Pl. Zoll. 95 (1828?).

Diclidium SCHRAD. Mart. Fl. Bras. II, 1, 51 (1829).

Torulinium DESV. Ham. Prodr Ind. Occ. 15 (1825).

Benth. and Hook., *Gen. Pl.* III, 1043; Durand, *Ind. Gen. Phan.* 456; Engler and Prantl, *Nat. Pflanz.* 2, II, 107 (Pax); Schenck, *Palaeophyt.* 383.

Living species: 400; tropical and temperate regions. Europe, 24; Russia, 14; Russian Europe, 6; U. S., 60; S. Sts., 41; E. Sts., 25; California, 11-14; Canada, 8; Rocky mts., 3; Pl. King, 3; Pl. Wheel., 7.

Fossil species: ?Miocene, Oeningen—*Cyperites*.

Cyperus speciosus VAHL, Enum. II, 253 (1806).

C. strigosus LAM. Ill. I, 726 (1791).

C. erythrorhizos TORR. Fl. I, 61 (1824).

C. michauxianus TORR. Fl. N. Y. II, 339 (1843).

Wats. and Coult., Gray's Man. 6 ed. 572; Britt., Fl. N. J. 261; Upham (*C. michauxianus* Schultes for Torr.), Fl. Minn. 150?; Chap., Fl. S. St. 507; Wats., Fl. Calif. II, 215; Webb., Fl. Neb. 99; Britt., Torr. Bull. XIII, 214.

North America: N. Eng. to Fla.; W. to Minn., Neb., Tex., N. Mex.; Gila and Rio Colorado to Ft. Yuma.

Minn. valley: Reported from S. central district; low and sandy shores.

HERB.: ?*Sandberg* 509, Red Wing.

Cyperus strigosus LINN. Spec. 47 (1753).

C. flavicomus MICHX. Fl. N. Am. I, 27 (1803).

C. michauxianus SCHULTES, Mant. II, 123 (1824).

C. stenolepis WATS. Fl. Calif. II, 215 (1880).

Wats. and Coult., Gray's Man. 6 ed. 571; Britt., Fl. N. J. 261; Upham, Fl. Minn. 150; Mac., Fl. Can. II, 94; Chap., Fl. S. St. 507; Cov., Fl. Ark. 229; Britt., Torr. Bull. XIII, 211; Webb., Appx. Neb. 24.

North America: Greenland and N. S. to Hudson Bay and Saskatchewan; S. to N. Eng., N. J. and Fla.; W. to Minn., Neb., Tex. and Pac. coast.

Minn. valley: Forest district; not infrequent; damp places along streams.

HERB.: *Sheldon* 1070, Springfield; *Herrick* 321, Minnetonka; *Sandberg* 508, Goodhue Co.

Cyperus strigosus LINN. var. **compressus** BRITT. Torr. Bull. XIII, 211 (1887).

Britt., Fl. N. J. 261.

N. J. and Penn. to Minn.

Minn. valley: Reported from S. Minn.; damp or drier places.

Cyperus esculentus LINN. Spec. 45 (1753).*C. phymatodes* MUHL. Gram. 23 (1817).*C. repens* ELL. Sk. I, 69 (1821).

Wats. and Coult., Gray's Man. 6 ed. 571; Britt., Fl. N. J. 260; Upham, Fl. Minn. 150; Webb., Fl. Neb. 99; Wats., Fl. Calif. II. 215; Mac., Fl. Can. II. 93; Chap., Fl. S. St. 508? Richt., Pl. Eur. 135; Engl. Pax., Nat. Pflanz. II, 2, 108; Cov., Fl. Ark. 229; Britt., Torr. Bull. XIII, 210.

Cosmopolitan.

North America: N. Br. to L. Erie; S. to Fla.; W. to Minn., Yosemite and Tex.

Minn. valley: Reported from forest district; rare; low places along streams.

Cyperus erythrorhizos MUHL. Gram. (1817).

Wats. and Coult., Gray's Man. 6 ed. 571; Britt., Fl. N. J. 261; Upham, Fl. Minn. 150; Mac., Fl. Can. II. 94; Chap., Fl. S. St. 512; Wats., Fl. Calif. II. 215; Cov., Fl. Ark. 229; Britt., Torr. Bull. XIII, 213,

North America: W. Ont. to L. I., N. J., Penn.; S. to Fla.; W. to Minn., Mich. and N. Mex.; also, Rio Colorado to Oregon.

Minn. valley: Throughout; rather common; banks.

HERB.: *Sheldon* 880, Sleepy Eye; *Ballard* 802, Goose lake; *Ballard* 832, Page lake; *Ballard* 892, St. Bonifacius; *Taylor* 1117, Glenwood; *Ballard* 274, Jordan, Scott Co.; *Sheldon* 1633, Taylor's Falls; *MacM.* and *Sheld.* 29, Brainerd; *Sandberg* 506, Goodhue Co.

Cyperus filiculmis VAHL, Enum. II, 328 (1806).*Scirpus cyperiformis* MUHL. Gram. 41 (1819).*Cyperus mariscoides* ELL. Sk. I, 67 (1821).

Wats. and Coult., Gray's Man. 6 ed. 570; Britt., Fl. N. J. 261; Mac., Fl. Can. II, 94; Upham, Fl. Minn. 150; Webb., Fl. Neb. 99; Chap., Fl. S. St. 511; Coult., Fl. Colo. 366; Cov., Fl. Ark. 229; Britt., Torr. Bull. XIII, 216.

North America: Ont. to N. Eng. and N. J.; S. to Fla.; W. to Minn., Neb., Kan., Ark., Colo. and Tex.

Minn. valley: Forest district and perhaps W.; dry and waste places.

HERB.: *Ballard* 636, Chaska, Carver Co.; *MacM.* and *Sheld.* 25, Brainerd; *Ballard* 18a, Goodhue Co.; *Leiberg* 76, Blue Earth Co.; *Sandberg* 511, Red Wing; 512, Red Wing.

Cyperus schweinitzii TORR. Cyp. 276 (1836).*C. alterniflorus* SCHWEIN. Long Appx. II, 381 (1825) *not R. Br.*

Wats. and Coult., Gray's Man. 6 ed. 570; Webb., Fl. Neb. 99; Upham, Fl. Minn. 150; Mac., Fl. Can. II, 93; Roth., Wheel. Exp. 274; Britt., Torr. Bull. XIII, 207.

North America: Ont. to L. of Woods, Qu'Appelle, Assiniboia; S. to W. N. Y. and Penn.; W. to Minn. Neb. and Can.

Minn. valley: Throughout; sandy ridges and shores of streams; abundant.

HERB.: *Ballard* 260, Jordan, Scott Co.; *Ballard* 635, Chaska; *Sheldon* 1056, Sleepy Eye; *Sheldon* 1193, New Ulm; *Taylor* 1149, Glenwood; *MacM.* and *Sheld.* 26 Brainerd; *Kasube* 251, Minneapolis; *Oestlund* 212, Minneapolis; *Leiberg* 75, Blue Earth Co.; *Sandberg* 510, Red Wing.

***Cyperus aristatus* ROTTB. Descr. 23 (1773).**

C. uncinatus PURSH, Fl. Am. I, 50 (1814).

C. inflexus MUHL. Gram. (1817).

C. confertus CHAPM. Fl. S. St. 510 (1860).

Wats. and Coult., Gray's Man. 6 ed. 570; Britt., Fl. N. J. 260; Webb., Fl. Neb. 99; Mac., Fl. Can. II. 93; Wats., Fl. Calif. II, 214; Coult., Fl. Colo. 366; Wats., King Exp. 360; Cov., Fl. Ark. 228; Britt., Torr. Bull. XIII, 207. Africa; E. Indies.

North America: Ont. to Man., Saskatchewan and Vancouver; S. on Pac. to S. Calif. and Lower Calif.; E. throughout U. S. to N. Eng. and Fla.; S. to Mexico.

Minn. valley: Throughout; abundant; sandy shores of rivers and ponds.

HERB.: *Sheldon* 1208, Redstone, near New Ulm; *Sheldon* 998, Sleepy Eye; *Sheldon* 1474, Pipestone; *Sheldon* 1090, Springfield; *MacM.* and *Sheld.* 6, Brainerd; *Sandberg* 507, Red Wing.

***Cyperus diandrus* TORR. Cat. N. Y. 90 (1819).**

Wats. and Coult., Gray's Man. 6 ed. 569; Britt., Fl. N. J. 260; Chap., Fl. S. St. 506; Mac., Fl. Can. II. 92; Wats., Fl. Calif. II, 214; Cov., Fl. Ark. 229; Britt., Torr. Bull. XII, 305; Upham, Fl. Minn. 150; Webb., Appx. Neb. 24.

North America: N. Br., Owen Sound, N. Eng.; S. to N. J., Fla.; W. to Minn., Neb., Ark., Tex. and N. Mex.; Calif?

Minn. valley: Throughout; low places and margins of lakes.

HERB.: *Taylor* 1052, Glenwood; *Taylor* 1144, Glenwood; *Ballard* 834, Page lake, Carver Co.; *Sheldon* 1629, Taylor's Falls; *MacM.* and *Sheld.* 22, Brainerd; *Leiberg* 74, Blue Earth Co.; *Oestlund* 210, Hennepin Co.; 211 Ramsey Co.

***Cyperus diandrus* TORR. var. *castaneus* (BIGEL.) Torr. Cat. N. Y. 90 (1819).**

C. castaneus BIGEL. Fl. Bost. 18 (1814).

C. flavescens var. *castaneus* PURSH, Fl. Am. I, 52 (1814).

C. bicolor BARTR. Fl. Phil. I, 27 (1818).

C. elliotianus R. and S. Mant. II, 100 (1824).

? *C. rimularis* KUNTH, Enum. I, (1833).

Wats. and Coult., Gray's Man. 6 ed. 569; Britt., Fl. N. J. 260; Upham, Fl. Minn. 150; Mac., Fl. Can., II. 93; Britt., Torr. Bull. XIII, 205; Webb., Appx. Neb. 24.

North America: N. Br. to Owen Sound; S. to N. J. and Fla.; W. to Minn., Neb., N. Mex. and Tex.; Sacramento and San Francisco, Calif.

Minn. valley: Reported from S. E. and forest district; banks of lakes, sandy beaches.

ERIOPHORUM LINN. Gen. 34 (1737).

Linagrostis ADANS. Fam. II, 41 (1763).

Trichophorum PERS. Syn. I, 69 (1805).

Benth. and Hook., Gen. Pl. III, 1052; Durand, Ind. Gen. Phan. 457; Engler and Prantl, Nat. Pflanz. 2. II, 111. (Pax).

Living species: 13; Europe, extratropical Asia and N. America. Europe, 8; Russia, 8; Russian Europe, 8; N. America, 10-11; Canada, 9-10; S. Sts., 2; Rocky mts., 2; E. Sts., 7; California, 2; Pl. King., 1.

Eriophorum virginicum LINN. Spec. 52 (1753).

Wats. and Coult., Gray's Man. 6 ed. 583; Britt., Fl. N. J. 265; Upham, Fl. Minn. 152; Webb., Fl. Neb. 98; Chap., Fl. S. St. 521; Mac., Fl. Can. II, 105; Engl. Pax, Nat. Pflanz. II, 2, 111.

North America: Newf., N. S., N. Br., Q., Ont. to Saskatchewan; S. to N. J., Fla.; W. to Minn., Neb. and Tex.

Minn. valley: Reported from S. E. district; doubtful; bogs and marshes.

Eriophorum gracile KOCH, Roth. Cat. II, 259 (1800).

Linagrostis paniculata var. *B.* LAM. Fl. Fr. III, 555 (1778).

Eriophorum triquetrum HOPPE, Taschenb. 106 (1800).

E. angustifolium TORR. Fl. N. Y. II, 359 (1843).

E. gracile var. *paucinervium* ENGELM. Gray's Man. ed. 2, 502 (1852).

Wats. and Coult., Gray's Man. 6 ed. 583; Mac., Fl. Can. II, 106; Upham, Fl. Minn. 152; Wats., Fl. Calif. II, 220; Coult., Fl. Colo. 368; Britt., Fl. N. J. 266; Richt., Pl. Eur. 136; Hook., Fl. Gt. Brit. 446; Led., Fl. Ross. IV, 255; Trautv., Fl. Sib. 122; Herd., Fl. Eur. Russ. 138; Hart., Fl. Scand. I, 450; Webb., Appx. Neb. 24; Rothr., Alask. 457.

Northern and central Europe; Siberia.

North America: Newf. and N. S. to Hudson Straits, Saskatchewan, Arctic sea and Ft. Wrangel, Alaska; S. to N. J., Minn., Neb. and Mo.

Minn. valley: Forest district; bogs and edges of marshes.

HERB.: Ballard 483, Prior's lake, Scott Co.; Taylor 519, Mud Lake, Waseca Co.; Ballard 114, Chaska; Taylor 87, Elysian; Sheldon 340, Madison Lake; Leiberg 83, Blue Earth Co.; Sandberg 522, Chisago lake.

Eriophorum latifolium HOPPE, Taschenb. 108 (1800).*E. polystachion* LINN. Fl. Suec. ed. II, 17 (1755).*E. polystachyon* DC. Fl. Fr. III, 131 (1805).*Linagrostis paniculata* LAM. Fl. Fr. III, 555 (1778).*Eriophorum vulgare* PERS. Syn. I, 70 (1805).*Carex alopecurus* LAB. Abr. Suppl. 141 (1818).*Eriophorum pubescens* Sm. Engl. Fl. I, 78 (1824).*E. polystachyon* var. *latifolium* GRAY, Man. 5 ed. (1868).

Wats. and Coult., Gray's Man. 6 ed. 583; Richt., Pl. Eur. 136; Mac., Fl. Can. II, 105; Upham, Fl. Minn. 152; Rothr., Alask. 457.

North America: Newf. to Alaska; S. to N. Eng. and Minn.

Minn. valley: N. E. district and to Blue Earth Co.; bogs and edges of marshes.

HERB.: *Bailey* 202, Vermilion lake.**Eriophorum polystachion** LINN. Spec. 52 (1753).*Linagrostis polystachya* SCOP. Fl. Carn. ed. 2, I, 48 (1772).*Eriophorum angustifolium* ROTH. Fl. Germ. II, 63 (1793).*E. vulgare* PERS. Syn. I, 70 (1805).

Wats. and Coult., Gray's Man. 6 ed. 583; Britt., Fl. N. J. 265; Mac., Fl. Can. II, 105; Chap., Fl. S. St. 521; Coult., Fl. Colo. 368; Upham, Fl. Minn. 152; Wats., Fl. Calif. II, 226; Richt., Pl. Eur. 136; Hook., Fl. Gt. Brit. 445; Engl. Pax, Nat. Pflanz. II, 2, 111; Wats., King Exp. 275; Hart., Fl. Scand. I, 449; Rothr., Alask. 457.

All Europe except Greece; N. Asia.

North America: Newf., N. S., N. Br., Q. to Hudson Straits, Arctic Sea and Vancouver; S. to Oregon and N. Cal.? W. Col. to Rocky mts. and across continent to N. Eng. and Ga.

Minn. valley: Throughout; abundant; bogs and edges of swamps.

HERB.: *Taylor* 738, Glenwood; *Taylor* 1108, Glenwood; *Sheldon* 208, Lake Washington, Blue Earth Co.; *Sheldon* 339, Madison Lake, Blue Earth Co.; *MacM.* and *Sheld.* 28, Brainerd; *Leiberg* 82, Blue Earth Co.; *Herrick* 323, Minneapolis; *Sandberg* 521, Red Wing; *Herb. Sheld.* 1715, Minneapolis; *Herb. Moyer* 243, Montevideo.**Eriophorum vaginatum** LINN. Spec. 52 (1753).*Linagrostis vaginata* SCOP. Fl. Can. 2 ed. I, 47 (1772).*Eriophorum caespitosum* HOST. Gram. I, 39 (1801).

Wats. and Coult., Gray's Man. 6 ed. 582; Mac., Fl. Can. II, 103; Upham, Fl. Minn. 152; Richt., Pl. Eur. 136; Hook., Fl. Gt. Brit. 445; Led., Fl. Ross. IV, 252; Trautv., Fl. Sib. 121; Herd., Fl. Eur. Russ. 138; Engl. Pax, Nat. Pflanz. II, 2, 111; Hart., Fl. Scand. I, 450; Rothr., Alask. 457.

Middle and northern Europe; temperate and northern Asia.

North America: Greenland, Labrador and Newf. to Hudson Bay, Brit. Col., Vancouver and Yukon region, Alaska;

S. to N. S., N. Br., N. Eng., N. J., Penn.; W. to Mich., Minn.; Dak. and Montana.

Minn. valley: Forest district; Ft. Snelling to Blue Earth Co.; bogs and marshes; rare.

HERB.: *Leiberg* 80, Blue Earth Co.; *Leiberg* 81, Blue Earth Co.; *Sandberg* 520, Chisago Lake; *Kassube* 256, Minneapolis.

Eriophorum cyperinum LINN. Spec. ed. 2, 77 (1762).

Trichophorum cyperinum PERS. Syn. I, 69 (1805).

Scirpus eriophorus VAHL, Enum. II, 282 (1806).

S. thyrsiflorus WILLD. Enum. I, 78 (1809).

S. cyperinus KUNTH, Enum. II, 170 (1837).

S. (Trichophorum) eriophorum TORR. Fl. N. Y. II, 356 (1843).

Wats. and Coult., Gray's Man. 6 ed. 582; Britt., Fl. N. J. 265; Upham, Fl. Minn. 152; Mac., Fl. Can. II, 102; Chap., Fl. S. St. 521; Engl. Pax, Nat. Pflanz. II, 2, 111; Cov., Fl. Ark. 230.

North America: Newf., Hudson Bay to Saskatchewan; S. to N. J., Fla., Minn., Neb. and Ark.

Minn. valley: Forest district and N. W.; marshes and swamps.

HERB.: *Ballard* 479, Prior's lake, Scott Co.; *Ballard* 454, Prior's lake, Scott Co.; *Ballard* 549, Spring lake, Scott Co.; *MacM. and Sheld.* 65, Brainerd; *Leiberg* 79, Blue Earth Co.; *Bailey* 164, Vermilion lake; *Herb. Sheld.* 1922, Minneapolis.

Eriophorum lineatum (MICHX.) B. and H. Gen. Pl. III, 1052 (1883).

Scirpus lineatus MICHX. Fl. N. Am. I, 32 (1803).

Trichophorum lineatum PERS. Syn. I, 39 (1805).

Scirpus pendulus MUHL. Gram. 44 (1817).

Isolepis lineata R. and S. Syst. II, 117 (1817).

Wats. and Coult., Gray's Man. 6 ed. 582; Britt., Fl. N. J. 265; Upham, Fl. Minn. 152; Chap., Fl. S. St. 521; Coult., Fl. Colo. 368; Mac., Fl. Can. II, 103; Engl. Pax, Nat. Pflanz. II, 2, 111.

North America: S. W. Ont. and N. Eng. to N. J. and Ga.; W. to Minn., W. Kan. and Mo.

Minn. valley: Reported from forest district; Ft. Snelling to Blue Earth Co.; low places along streams and around ponds.

SCIRPUS LINN. Gen. 32 (1737).

Haplostemum, Aplostemon, Diplarrhenus, Distichmus RAF. Jour. Phys. LXXXIX, 105 (1819).

Oxycaryum, Blepharolepis NEES, Mart. Fl. Bras. II, 90, 91 (1829).

Androcoma NEES, Hook. Jour. Bot. II, 396 (1836).

Malachochaete, Hymenochaete NEES, Linn. IX, 292, 293 (1835).

Nomochloa, Hymenochaeta BEAUV. Lestib. Ess. Fam. Cyp. 37, 43 (1819).

Blysmus PANZ. R. and S. Syst. II, Mant. 41 (1824).

Pterolepis SCHRAD. Gött. Gel. Anz. 2071 (1821).

Heleophylax LESTIB. Ess. Fam. Cyp. 41 (1819).

Hellmuthia, Anthophyllum STEUD. Syn. Glum. II, 90, 160 (1855).

Elytrospermum C. A. MEY. Mem. Sav. Etr. Petr. I, 200 (1841?).

Desmoschoenus HOOK. f. Fl. N. Zeal. I, 271 (1867).

Eleogiton, Holoschoenus LINK, Hort. Berol. I, 284, 293 (1827).

Dichostylis BEAUV. Lestib. Ess. Fam. Cyp. 39 (1819).

Isolepis R. BR. Prodr. 221 (1810).

Nemum DESVX. Ham. Prodr. Ind. Occ. 13 (1825).

Baeothryon EHRH. Beitr. IV, 147 (1789).

Benth. and Hook., *Gen. Pl.* III, 1049; Durand, *Ind. Gen. Phan.* 457; Engler and Prantl, *Nat. Pflanz.* 2, II, 111 (Pax); Schenck, *Palaeophyt.* 385.

Living species: 200; 300 described; cosmopolitan. Europe, 37; Russia, 20; Russian Europe, 10; U. S., 35-40; Canada, 10; S. Sts., 14; E. Sts., 17-19; Rocky mts., 10; California, 12-15; Pl. King, 5; Pl. Wheel., 5.

Fossil species: Cyperites? Miocene, Oeningen.

Scirpus atrovirens MUHL. Gram. 43 (1817).

? *S. polyphyllus* VAHL, Enum. II, 274 (1806).

S. sylvaticus var. *atrovirens* GRAY, Man. ed. 2, (1856).

Wats. and Coult., Gray's Man. 6 ed. 581; Britt., Fl. N. J. 265, Webb., Fl. Neb. 98; Upham, Fl. Minn. 152; Wats., Fl. Calif. II, 219; Mac., Fl. Can. II, 101; Coult., Fl. Colo. 368; Cov., Fl. Ark. 230.

North America: N. S., N. Br., Q., Ont. to Man. and Saskatchewan; S. to N. Eng. and N. J.; W. to Minn., Neb., Kan., Ark., Ind. Terr., Colo. and to Calif. and Oregon.

Minn. valley: Throughout; marshes and bogs; abundant.

HERB.: *Taylor* 763, Glenwood; *Sheldon* 1303, Lake Benton; *Sheldon* 1081, Springfield; *Sheldon* 1042, Sleepy Eye; *Sheldon* 673, Gaiter lake, Waseca Co.; *Ballard* 217, Jordan, Scott Co.; *Taylor* 634, Minnesota lake; *MacM.* and *Sheld.* 41, Brainerd; *Sandberg* 519, Red Wing; *Oestlund* 217, Hennepin Co.; *Sheldon* 252, Lake Washington, Le Sueur Co.

Scirpus sylvaticus LINN. var. **microcarpus** (PRESL).

S. microcarpus PRESL, Rel. Haenk. I, 193 (1830).

S. sylvaticus HOOK. Fl. Am. II, 230 (1840).

S. lenticularis TORR. Cyp. 328 (1836).

S. sylvaticus var. *digynus* BOECKL. Linn. XXXVI, 727 (1862).

Wats. and Coult., Gray's Man. 6 ed. 581; Mac., Fl. Can. II, 101; Wats., Fl. Calif. II, 219; Upham, Fl. Minn. 152; Coult., Fl. Colo. 368; Rothr., Fl. Alask. 457; Britt., Trans. N. Y. Acad. XI, 74-93.

North America: N. S., Ont. to Minn., Man., Selkirks and Vancouver; N. to Hudson Bay and Yukon river; S. to Colo. and Calif.

Minn. valley: Forest district; along streams and in edges of marshes.

HERB.: *Sheldon* 275, Madison Lake; *Ballard* 12a, Zumbrota; *Sandberg* 611, Red Wing; *Ballard* 340, Jordan, Scott Co.

***Scirpus fluviatilis* (TORR.) GRAY**, Man. v ed. 564 (1868).

S. maritimus var. (?) *fluviatilis* TORR. Fl. N. Y. II, 354 (1843), *excl. syn.*

? *S. robustus* PURSH, Fl. Am. I, 56 (1814), *in part.*

Wats. and Coult., Gray's Man. 6 ed. 581; Britt., Fl. N. J. 265; Upham, Fl. Minn. 151; Webb., Fl. Neb. 99; Mac., Fl. Can. II, 100; Coult., Fl. Colo. 367.

North America: Q., Ont. to Man.; S. to W. Vt., Conn., N. J., Penn.; W. to Minn., Neb., Iowa and Mont.?

Minn. valley; Throughout; but principally in forest district; shallow waters, borders of lakes.

HERB.: *Sheldon* 249, Lake Washington, Le Sueur Co.; *Ballard* 54, Chaska; *Sheldon* 982, Cross lake, Brown Co.; *Bailey* 21, Vermilion lake; *Oestlund* 216, Minneapolis.

***Scirpus lacustris* LINN.** Spec. 48 (1753).

S. altissimus GILIB. Exerc. Phyt. II, 514 (1792).

S. validus PURSH, Fl. Am. I, 56 (1814).

S. brayi HOPPE, R. and S. Syst. II, 137 (1817).

S. orgyis RAF. Am. Nat. (1820).

S. andrzejkowskii, *jantii*, *lithuanicus*, *manophyllus*, *wolfgangii* BESS. Schultes Mant. II, 535 (1824).

S. glaucus SM. Engl. Fl. I, 57 (1824).

Heleogeton glaucum REICH. Fl. Exc. 77 (1830).

Scirpus custoris HEG. Fl. Sched. 49 (1840).

Schoenoplectus lacustris and *tabernaemontani* PALLA, Sitzb. Z. B. G. XXXVIII, 49 (1888).

Wats. and Coult., Gray's Man. 6 ed. 580; Britt., Fl. N. J. 264; Upham, Fl. Minn. 151; Mac., Fl. Can. II, 99; Webb., Fl. Neb. 99; Chap., Fl. S. St. 520; Wats., Fl. Calif. II, 217; Coult., Fl. Colo. 367; Richt., Pl. Eur. 140; Hook., Fl. Gt. Brit. 442; Led., Fl. Ross.; Herd., Fl. Eur. Russ. 138; Cov., Fl. Ark. 230; Hart., Fl. Scand. I. 445.

Europe; Asia; Australasia; Sandwich Islands.

North America: Newf., N. S., N. Br. to Lake Winnipeg, Saskatchewan, Brit. Col. and Vancouver; S. to Fla.; W. to Rockies and Pac. coast (*in var.*)

Minn. valley: Throughout; edges of ponds; shallow lakes.

HERB.: *Taylor* 213, Janesville; *Ballard* 31, Chaska; *Sheldon* 876, Sleepy Eye; *Sheldon* 1083, Springfield; *Taylor* 410, Lake Elysian; *Bailey* 219, Vermilion lake; *Kassube* 255, Hennepin Co.; *Sandberg* 518, Goodhue Co.

Scirpus triangularis (PERS.).

S. mucronatus ALL. Fl. Ped. II, 277 (1785).

S. triqueter ROTH. N. Beitr. I, 91 (1802).

S. triqueter var. *triangularis* PERS. Syn. I, 91 (1805).

S. americanus PERS. Syn. I, 92 (1805).

S. pungens VAHL. En. II, 255 (1806).

S. rothii HOPPE, Sturm Dan. Fl. II, 36 (1814).

S. tenuifolius DC. Fl. Fr. VI, 300 (1815).

Eleocharis leptophylla SCHULT. Mant. II, 88 (1824).

Heleogiton pungens REICH. Fl. Exc. 78 (1830).

Schoenoplectus pungens PALLA, Sitz. Z. B. G. XXXVIII, 49 (1888).

Wats. and Coult., Gray's Man. 6 ed. 579; Britt., Fl. N. J. 264; Upham, Fl. Minn. 151; Mac., Fl. Can. II, 99; Webb., Fl. Neb. 99; Chap., Fl. S. St. 519; Coult., Fl. Colo. 366; Wats., Fl. Calif. II, 218; Richt., Pl. Eur. 141; Hook., Fl. Gt. Brit. 442; Roth., Wheel. Exp. 275; Cov., Fl. Ark. 230.

Central Europe; Mediterranean region; Australia; S. America and W. Indies.

North America: Newf., Hudson Bay and Saskatchewan to Vancouver and Ft. Wrangel, Alaska; S. throughout N. Amer.

Minn valley: Forest district and W. ?; borders of lakes, ponds and streams.

HERB.: *Sheldon* 86, Elysian; *Kassube* 254, Minneapolis; *Oestlund* 215, Minneapolis.

HELEOCHARIS R. BR. Prodr. 224 (1810).

Bulbostylis RAF. Bull. Mosc. X, 355 (1813).

Limnochloa, **Scirpidium**, **Chaetocyperus**, **Eleogenus** NEES, Linn. IX, 289, 293, 294 (1835).

Benth. and Hook., Gen. Pl. III, 1047; Durand, Ind. Gen. Phan. 456; Engler and Prantl, Nat. Pflanz. 2, II, 112 (Pax).

Living species: 80; tropics and N. hemisphere to Arctic regions. Europe, 8; Russia, 8; Russian Europe, 8; N. America, 30; S. Sts., 25; E. Sts., 21; California, 9-10; Canada, 10; Rocky mts., 5; Pl. King, 2; Pl. Wheel., 2.

Heleocharis wolffii GRAY, Proc. Am. Acad. X, 77 (1874).

Wats. and Coult., Gray's Man. 6 ed. 576; Upham, Fl. Minn. 151; Britt., Journ. N. Y. Micro. Soc. V, 105.

North America: Iowa and Minn.

Minn. valley: Reported from edge of valley; doubtful or local; wet prairies and edges of sloughs.

HERB.: *Cratty* 20, Emmet Co., Iowa.

Heleocharis acicularis (LINN.) R. BR. Prodr. I, 80 (1810).*Scirpus acicularis* LINN. Spec. 48 (1753).*Cyperus acicularis* WITH. Arr. Brit. Pl. 78 (1776).*Mariscus acicularis* MOENCH, Meth. 350 (1794).*Scirpus trichodes* MUHL. Gram. 30 (1817).*Eleocharis costata* PR. Fl. Cech. 11 (1819).*Isolepis acicularis* SCHLECHT. Fl. Berol. I, 36 (1823).*Scirpus chaeta* SCHULTES, Mant. II. 272 (1824).*Clavula acicularis* DUM. Fl. Belg. 143 (1827).*Linnochloa acicularis* REICH. Fl. Exc. 78 (1830).*Scirpidium acicularis* NEES, Linn. IX, 293 (1835).*Chaetocyperus urceolatus* LEIBM. Mex. Halvg. 243 (1849).

Wats. and Coult., Gray's Man. 6 ed. 576; Britt., Fl. N. J. 263; Upham, Fl. Minn. 151; Webb., Fl. Neb. 99; Coult., Fl. Colo. 369; Mac., Fl. Can. II, 97; Chap., Fl. S. St. 518; Wats., Fl. Calif. II, 221; Richt., Pl. Eur. 143; Led., Fl. Ross. IV, 243; Hook., Fl. Gt. Brit. 441; Herd., Fl. Eur. Russ. 138; Engl. Pax, Nat. Pflanz. II, 2, 112; Wats., King Exp. 360; Roth., Wheel. Exp. 275, 376; Cov., Fl. Ark. 229; R. and S., Syst. II, 154; Britt., Jour. Mic. Soc. N. Y. V, 104; Hart., Fl. Scand. I, 449.

Northern hemisphere to N. W. India and Mexico.

North America: N. S., Hudson Bay and Saskatchewan; S. to N. J., Fla. and Mex.; W. to Pac. from Santa Barbara to Brit. Col.

Minn. valley: Throughout; wet places, borders of marshes and shores of lakes.

HERB.: *Taylor* 1084, Glenwood; *Sheldon* 817, Sleepy Eye; *Sheldon* 161, Madison Lake, Blue Earth Co.; *Ballard* 790, Swan lake, Carver Co.; *Ballard* 281, Jordan, Scott Co.; *Ballard* 79, Chaska; *Taylor* 74, Elysian; *MacM.* and *Sheld.* 52, Brainerd; *Bailey* 150, Vermilion lake; *Kassube* 253, Minneapolis; *Oestlund* 213, Ramsey Co.; *Sandberg* 516, Red Wing; *Sandberg* 517, Chisago Co.; *Leiberg* 78, Blue Earth Co.; *Leiberg* 79, Blue Earth Co.; *Herb. Sheld.* 1848, Minneapolis.

Heleocharis tenuis (WILLD.) SCHULTES, Mant. II. 89 (1824).*Scirpus tenuis* WILLD. Enum. I, 76 (1809).

Wats. and Coult., Gray's Man. 6 ed. 575; Britt., Fl. N. J. 263; Upham, Fl. Minn. 151; Mac., Fl. Can. II, 97; Chap., Fl. S. St. 517; Cov., Fl. Ark. 230; Britt., Jour. N. Y. Micro. Soc. V, 108.

North America: N. S. to Lake Nipigon, L. Winnipeg, Assiniboia and Rockies; S. to N. J. and N. Car.; W. to Minn. and Mo.

Minn. valley: Forest district; peat bogs and marshes.

HERB.: *Taylor* 29, Elysian; *Taylor* 640, Minnesota lake; *Sandberg* 515, Center City, Chisago Co.

Heleocharis intermedia (MUHL.) SCHULTES, Mant. II, 91 (1824).

Scirpus intermedius MUHL. Gram. 31 (1817).

Wats. and Coult., Gray's Man. 6 ed. 575; Britt., Fl. N. J. 263; Up ham Fl. Minn. 157; Mac., Fl. Can. II, 96; Chap., Fl. S. St. 576; Mac., Fl. Can. II, 373; Britt., Jour. N. Y. Micro. Soc. V, 110.

North America: Ont. and N. Y. to N. J., Penn., Iowa and Minn.

Minn. valley: Reported from S. central district; peat bogs and swamps.

Heleocharis acuminata (MUHL.) NEES, LINN. IX, 294 (1835).

Scirpus acuminatus MUHL. Gram. 27 (1817).

Heleocharis compressa SULLIV. Sill. Journ. XLII, 50 (1842).

Wats. and Coult., Gray's Man. 6 ed. 576; Mac., Fl. Can. II, 96; Upham, Fl. Minn. 151; Coult., Fl. Colo. 369; Chap., Suppl. S. St. 659; Britt., Jour. Micro. Soc. N. Y. V, 108.

North America: N. Y. and Ont. to Minn., Mo., Colo.; S. to Ga. and Tenn.

Minn. valley: Forest district; Ft. Snelling to Blue Earth Co.; swamps and wet places.

HERB.: *Sundberg 514*, Chisago lake; *Sheldon 1847*, Ft. Snelling.

Heleocharis palustris (LINN.) R. BR. Prodr. I, 80 (1810).

Scirpus palustris LINN. Spec. 47 (1753).

S. baiothyron WAHL. Suppl. 3 (1796).

S. reptans THUILL. Fl. Par. ed. 2, I, 22 (1799).

S. varius SCHREB. in Schw. and K. Fl. Erl. 11 (1804).

Eleocharis polycaula WEND. Beitr. Hass. 19 (1823).

E. uniglumis SCHULTES, Mant. II, 88 (1824).

Scirpus melanostachys D'URV. Mal. 29 (1825).

Clavula palustris DUM. Fl. Belg. 143 (1827).

Fimbristylis melanostachya BROGN. Dup. Voy. 81 (1828).

Scirpus glaucescens MER. Fl. Par. ed. 3, 44 (1831-34).

Wats. and Coult., Gray's Man. 6 ed. 575; Webb., Fl. Neb. 99; Upham, Fl. Minn. 150; Mac., Fl. Can. II, 95; Chap., Fl. S. St. 518; Britt., Fl. N. J. 262; Coult., Fl. Colo. 369; Wats., Fl. Calif. II, 221; Richt., Pl. Eur. 142; Led., Fl. Ross. IV, 244; Hook., Fl. Gt. Brit. 441; Nym., Fl. Eur.; Trautv., Fl. Sib. 120; Herd., Fl. Eur. Russ. 138; Engl. Pax, Nat. Pflanz. II, 2, 112; Wats., King Exp. 360; Roth., Wheel. Exp. 275, 376; Cov., Fl. Ark. 229; R. and S., Syst. Veg. II, 151; Hart., Fl. Scand. I, 448.

Europe; Mediterranean region; all Asia; Malay Archipelago; Australasia.

North America: Can. throughout to Greenland, Hudson Bay and Bear lake; U. S. throughout to Fla. and Mex.

Minn. valley: Throughout; abundant; wet meadows, marshes and in shallow water.

HERB.: *Sheldon 13*, Elysian; *Sheldon 1411*, Lake Benton; *Sheldon 181*, Eagle lake, Blue Earth Co.; *Taylor 406*

Elysian; *Taylor* 19, Elysian; *Ballard* 24, Chaska; *Ballard* 495, Prior's lake, Scott Co.; *Taylor* 620, Minnesota lake; *MacM.* and *Sheld.* 53, Brainerd; *Kassube* 252, Minneapolis; *Bailey* 19, Vermilion lake; *Bailey* 535, Long lake; *Sheldon*, 1620, Ramsey Co.

***Heleocharis palustris* (LINN.) R. BR. var. *glaucescens* (WILLD.) GRAY**, *Man.* ed. v, 558 (1868).

Scirpus glaucescens WILLD. *Enum.* 76 (1809).

Eleocharis glaucescens R. and S. *Mant.* II, 89 (1824).

E. calva TORR. *Fl. N. Y.* II, 346 (1843).

Wats. and Coult., *Gray's Man.* 6 ed. 575; Britt., *Fl. N. J.* 262; Upham, *Fl. Minn.* 151; Mac., *Fl. Can.* II, 96; Britt., *Jour. Micro. Soc. N. Y.* V, 103; Webb., *Appx. Neb.* 24.

North America: With type east of Minn. and S. of Nipigon river, also in Nebraska.

Minn. valley: Reported from N. E. district; infrequent or rare; localities with the typical form.

***Heleocharis ovata* (ROTH.) R. BR. Prodr. I, 80 (1810).**

Scirpus capitatus SCHREB. *Spic. Lips.* 60 (1771).

S. compressus MOENCH, *Meth.* 349 (1794).

S. annuus THUILL. *Fl. Par.* ed. 2, I, 22 (1799).

S. ovatus ROTH. *Cat.* II, 5 (1800).

S. nutans BERG. *Fl. Pyr.* I, 43 (1803).

S. soloniensis DUB. *Meth. Ort.* 295 (1803).

S. turgidus PERS. *Syn.* I, 66 (1805).

S. multicaulis GMEL. *Fl. Bad.* 96 (1805).

S. obtusus WILLD. *Enum.* I, 76 (1809).

Eleocharis obtusa SCHULTES, *Mant.* II, 89 (1824).

Clavula ovata DUM. *Fl. Belg.* 143 (1827).

Eleogenus ovatus NEES, *Linn.* IX, 294 (1834).

Eleocharis diandra WRIGHT, *Torr. Bull.* X, 101 (1883).

Wats. and Coult., *Gray's Man.* 6 ed. 574; Webb., *Fl. Neb.* 99; Britt., *Fl. N. J.* 262; Mac., *Fl. Can.* 95; Wats., *Fl. Calif.* II, 222; Chap., *Fl. S. St.* 518; Upham, *Fl. Minn.* 150; Richt., *Pl. Eur.* 143; Herd., *Fl. Russ. Eur.* 138; Engl. Pax, *Nat. Pflanz.* II, 2, 112; Mac., *Fl. Can.* II, 372; Cov., *Fl. Ark.* 229; Britt., *Journ. N. Y. Micro. Soc.* V, 102; R. and S., *Syst.* II, 152.

Central Europe, Siberia and India.

North America: N. S., N. Br., Q., Ont. to Georgian Bay and Saskatchewan; S. to N. Eng., N. J., Fla.; W. to Minn., Dak., Neb., Ark. and Tex.; Brit. Col. to Oregon, Plumas Co., Calif., and Yosemite.

Minn. valley: Forest district; infrequent; in wet places.

HERB.: *Ballard* 439, Prior's lake, Scott Co.

IRIA RICH. *Pers. Syn.* I, 65 (1805).

***Fimbristylis* VAHL**, *Enum.* II, 285 (1806).

***Abildgaardia* VAHL**, l. c. 296 (1806).

Mischospora BOECKL. *Flora*. 113 (1860).

Gussonea PRESL, *Rel. Haenk.* I, 183 (1830).

Pogonostylis BERTOL. *Fl. Ital.* I, 312 (1833).

Trichelostylis LESTIB. *Ess. Fam. Cyp.* 40 (1819).

Oncostylis NEES, *Mart. Fl. Bras.* II, 1, 80 (1829).

Leptoschoenus NEES, *Hook. Journ. Bot.* II, 393 (1836).

Echinolytrum DESVX. *Jour. Bot.* I, 20 (1808).

Benth. and Hook., *Gen. Pl.* III. 1048; Durand, *Ind. Gen. Phan.* 457; Engler and Prantl, *Nat. Pflanz.* 2, II. 113 (Pax); O. Kuntze, *Rev. Gen.* II. 751.

Living species: 200; tropical and temperate regions. Europe, 4; Russia, 2; U. S. 6-7; S. Sts., 7; Rocky mts., 1; E. Sts., 4; California, 3; Pl. King, 2; Pl. Wheel., 2.

Iria capillaris LINN. OK. *Rev. Gen.* II, 753 (1891).

Scirpus capillaris LINN. *Spec.* 49 (1753).

Isolepis capillaris R. and S. *Syst.* II, 118 (1817).

Scirpus muhlenbergii SPRENG. *Syst.* I, 207 (1825).

Fimbristylis capillaris GRAY, *Man. ed.* I, 530 (1848).

Wats. and Coult., *Gray's Man.* 6 ed. 578; Britt., *Fl. N. J.* 263; Upham, *Fl. Minn.* 152; Chap., *Fl. S. St.* 522; Wats., *Fl. Calif.* II, 223; Roth., *Wheel. Exp.* 275; Cov., *Fl. Ark.* 230; Webb., *Appx. Neb.* 24.

Tropical and subtropical regions.

North America: N. Eng. to N. J. and Fla.; W. to Minn., Neb., Tex., Arizona, Calif. and Oregon.

Minn. valley: S. W. district; perhaps S. central and S. E. districts; sandy places.

HERB.: *Sheldon 1201*, Redstone, near New Ulm.

MARISCUS HALL. *En. Stirp. Helv.* 251 (1742).

Pseudocyperus SEGU. *Pl. Veron.* I, 115 (1745).

Cladium P. BR. *Hist. Jamaic.* 114 (1756).

Baumea and **Vincentia** GAUDICH. *Freye. Bot. Voy.* 416, 417 (1826).

Agylla PHILIPPI, *Anal. Univ. Chile*, I, 643 (1885).

Terobera STEUD. *Syn. Pl. Glum.* II, 164 (1855).

Trasi BEAUV. *Lestib. Ess. Fam. Cyp.* 32 (1819).

Machaerina VAHL, *Enum.* II, 238 (1806).

Trachyrhynchium NEES, *Herb. Meyen.*

Chapelliera NEES, *Linn.* IX, 298 (1835).

Schoenopsis BEAUV. *Lestib. Ess. Fam. Cyp.* 34 (1819).

Benth. and Hook., *Gen. Pl.* III, 1065; Durand, *Ind. Gen. Phan.* 460; Engler and Prantl, *Nat. Pflanz.* 2, II, 116 (Pax); O. Kuntze, *Rev. Gen.* II, 754.

Living species: 30; tropical and temperate regions; especially Australia and New Zealand. Europe, 2; N. America, 3; California, 2; Atl. States, 2; Canada, 1.

Mariscus mariscoides (MUHL.) O. KUNTZE, *Rev. Gen.* II, 755 (1891).

Schoenus mariscoides MUHL. Gram. 5 (1817).

Cladium mariscoides TORR. Cyp. 372 (1836).

Wats. and Coult., Gray's Man. 6 ed. 586; Upham, Fl. Minn. 152; Britt., Fl. N. J. 268; Mac., Fl. Can. II, 107; Chap., Suppl. 660.

North America: N. S., N. Br., Q., Ont. to N. J., Del., N. Car. and Fla.; W. to S. Minn. Iowa and Ark?

Minn. valley: Reported from S. E. edge; bogs and wet meadows; doubtful.

RHYNCHOSPORA VAHL, Enum. II, 229 (1806).

Haplostylis, Morisia, Mitrospora, Diplochaeta, Cephaloschoenus, Echinostchoenus, Calyptrostylis, Ceratoschoenus, Haloschoenus, Nomochloa NEES, Linn. IX, 295, 296 (1835).

Trichochaeta, Ptilosciadium, Calyptralepis STEUD. Syn. Glum. II, 151 *seq.* (1855).

Sphaeroschoenus NEES, Pl. Meyen. 97 (1835).

Pterotheca PRESL, Symb. Bot. I, 55 (1832).

Asteroschoenus, Ehippiorhynchium, Ptilochaeta, Nemochloa NEES, Mart. Fl. Bras. II, 1, 134, *seq.* (1829).

Spermodon, Zosterospermon BEAUV. Lestib. Ess. Fam. Cyp. 27, 28 (1819).

Pleurostachys BRONGN. Dup. Voy. Coq. Bot. 172 (1829).

Benth. and Hook., Gen. Pl. III, 1058; Durand, Ind. Gen. Phan. 459; Engler and Prantl, Nat. Pflanz. 2, II, 116 (Pax).

Living species: 150; tropical and subtropical regions; extending to Canada. N. America, 50; S. Sts., 45; E. Sts., 14; Canada, 4; Europe, 2; Russian Europe, 2; Russia, 2.

Rhynchospora setacea (MUHL.).

Schoenus setaceus MUHL. Gram. 6 (1817).

Rhynchospora capillacea TORR. Fl. N. Amer. I, 55 (1824).

Wats. and Coult., Gray's Man., 6 ed. 585; Britt., Fl. N. J. 267; Upham, Fl. Minn. 152; Mac., Fl. Can. II, 107.

North America: N. Vt. and Ont. to N. J. and Penn.; W. to W. N. Y. and Minn.

Minn. valley: S. central district; peat bogs and marshes.

HERB.: *Leiberg 84, 85*, Blue Earth Co.

Rhynchospora alba (LINN.) VAHL, Enum. II, 236 (1806).

Schoenus albus LINN. Spec. 51 (1753).

Mariscus albus GILIB. Exerc. Phyt. II, 512 (1792).

Wats. and Coult., Gray's Man. 6 ed. 585; Britt., Fl. N. J. 267; Upham, Fl. Minn. 152; Mac., Fl. Can. II, 107; Chap., Fl. S. St. 527; Richt., Pl. Eur. 145; Led., Fl. Ross. IV. 259; Hook., Fl. Gt. Brit. 446; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 138; Engl. Pax, Nat. Pflanz. II, 2, 116; Wats., Fl. Calif. II, 213; Cov., Fl. Ark. 230; Rothr., Alask. 457.

Northern and middle Europe; Siberia.

North America: Newf. to Hudson Bay and Alaska; S. to N. J. and Fla.; W. to N. Ind., Minn., Ark. and Oregon.

Minn. valley: Reported from S. E. and N. E. districts; rare; bogs and marshes.

HERB.: *Bailey 319*, St. Louis river.

SCLERIA BERG. K. Vet. Ac. H. Stockh. XXVI, 142 (1765).

Diaphora LOUR. Cochinch. 578 (1790).

Diplacrum R. BR. Prodr. 241 (1810).

Diploscyphum LIEBM. Mex. Halvgr. 74 (1849).

Schizolepis SCHRAD. Mart. Fl. Bras. II, 1, 186 (1829).

Sphaeropus BOECKL. Flora 89 (1873).

Hypoporum, Cyindropus NEES, Linn. IX, 303 (1835).

Trachylomia, Mastigoscleria, Chondrolomia, Hymenolotrum, Ophryoscleria NEES, Mart. Fl. Bras. II, 1, 173 *seq.* (1829).

Macrolomia SCHRAD. ex. Nees, Mart. Fl. Bras. I c. 181 (1829).

Benth. and Hook., *Gen. Pl.* III, 1070; Durand, *Ind. Gen. Phan.* 461; Engler and Prantl, *Nat. Pflanz.* 2, II, 120 (Pax).

Living species: 100; tropical and subtropical regions, extending N. in Atl. N. America. N. America, 12-13; Canada, 2; E. Sts., 6; S. Sts., 12.

Scleria verticillata MUHL. Willd. Spec. IV, 317 (1805).

Hypoporum verticillatum NEES, Linn. IX, 303. (1835).

Wats. and Coult., Gray's Man. 6 ed. 587; Upham, Fl. Minn. 153; Britt., Fl. N. J. 268; Chap., Fl. S. St. 532; Engl. Pax, *Nat. Pflanz.* II, 2, 121.

North America: E. Mass. to N. J. and Fla.; W. to S. Ont., Minn., Ill. and Tex.

Minn. valley: S. central district; rare; bogs and marshes.

HERB.: *Leiberg 86, 87*, Blue Earth Co.

Scleria triglomerata MICHX. Fl. N. A. II, 168 (1803).

S. nitida WILLD. Enum. II, 350 (1809).

S. flaccida STEUD. Syn. 174 (1840).

Cladium triglomeratum NEES, Linn. IX, 301 (1835).

Trachylomia triglomerata NEES, Mart. Fl. Brazil, II, 1, 174 (1842).

Wats. and Coult., Gray's Man. 6 ed. 586; Britt., Fl. N. J. 268; Upham, Fl. Minn. 153; Chap., Fl. S. St. 531; Mac., Fl. Can. II, 108; Cov., Fl. Ark. 231; Britt., Rev. Scler., N. Y. Acad. III, 129 (1883-85).

North America: Ont., Mass. and Vt. to N. J., N. Car. and Fla.; W. to Minn., Ark. and Tex.

Minn. valley: Reported from S. E. edge; infrequent; swamps and marshes.

CAREX LINN. Gen. 705 (1737).

Carex, Scuria, Triplima, Triodus RAF. Jour. Phys. LXXXIX, 106 (1819).

Maukschia, Leucoglochin, Callistachys, Genersichia, Cryptoglochin HEUFFL. Flora, 527, 528 (1844).

Pseudocarex MIQ. Ann. Mus. Lugd.-Bat. II, 146; ex B. and H. Gen. l. c.

Schelhammeria MOENCH, Meth. Suppl. 119 (1802).

Psyllophora EHRL. Beitr. IV, 146 (1789).

Vignea BEAUV. ex Schur. Transsylv. 696 (1866).

Vignantha SCHUR. ex Schur. l. c. (1866).

Benth. and Hook., *Gen. Pl.* III, 1073; Durand, *Ind. Gen. Phan.* 461; Engler and Prantl, *Nat. Pflanz.* II, 2, 122 (Pax); Schenck, *Palaeophyt.* 385.

Living species: 1000 described; 500 distinct; temperate and colder regions, and a few in tropical mts. N. America, 250±; S. Sts., 80-85; E. Sts., 135±; Rocky mts., 90-95; California, 90-100; Canada, 200; Pl. King, 58; Pl. Wheel., 41; Europe, 190-195; Russian Europe, 140; Russia, 200±.

Fossil species: ?Tertiary; France, Arctic regions (*Heer*).

Carex sychnocephala CAREY, Sill. Journ. ser. 2, IV, 24 (1847).

C. cyperoides DEW. Sill. Journ. ser. 2, III, 171 (1846) not Linn.

Wats. and Coult., Gray's Man. 6 ed. 622; Mac., Fl. Can. II, 121.

North America: Ont. to Man.; S. to central N. Y. and W. Minn.

Minn. valley: Far S. W. districts, and probably N. edge also; rare and local.

HERB.: *Sheldon 1509*, Lake Benton; *MacM.* and *Sheld. 61*, Brainerd.

Carex straminea WILLD. Schkr. Car. 49, 34 (1801).

C. straminea var. *minor* DEW. Sill. Journ. XI, 158 (1826).

C. tenera SARTW. Exsicc. 45 (1848).

C. festucacea var. *tenera* CAREY, Gray's Man. ed. 1, 545 (1848).

C. straminea var. *tenera* BOOTT, Ill. 120, 384 (1862).

C. tenera f. *erecta* OLN. Exsicc. II, 14 (1871).

Wats. and Coult., Gray's Man. 6 ed. 621; Mac., Fl. Can. II, 131; Webb., Fl. Neb. 98; Britt., Fl. N. J. 278; Coult., Fl. Colo. 397; Chap., Fl. S. St. 535; Upham, Fl. Minn. 155; Mac., Fl. Can. II, 378; Wats., King Exp. 367; Bail., Syn. Car. 149.

North America: Ont. to Man.; S. to N. Eng., N. J. and Penn.; W. to Minn., Neb., Colo., Utah and Arizona.

Minn. valley: Forest district; openings in woods and thicket edges; not infrequent.

HERB.: *Taylor 13*, Elysian; *Ballard 5a*, Zumbrota; *Kassube 262*, Minneapolis.

Carex straminea WILLD. var. *brevior* DEW. Sill. Journ. XI, 158 (1826).

C. festucacea WILLD. Spec. IV, 242 (1805).

C. straminea SCHKR. Car. Nachtr. 23, 174 (1806).

C. straminea var. *schkuhrii* GAY, Ann. Sci. Nat. 2, X, 363 (1838).

C. straminea var. *festucacea* TUCKER. Enum. 18 (1843).

C. straminea, *typica* and vars. *crawei* and *meadii* BOOTT, Ill. 121 (1862).

C. foenea BOOTT, Ill. 118, 376 (1862).

C. straminea vars. *hyalina* and *typica* GRAY, Man. ed. 5, 580-581 (1868).

C. tenera var. *suberecta* OLN. Exsicc. II, 13 (1871).

Wats. and Coult., Gray's Man. 6 ed. 622; Mac., Fl. Can. II, 131; Chap., Fl. S. St. 535; Upham, Fl. Minn. 155; Mac., Fl. Can. II, 378; Webb., Appx. Neb. 23.

North America: N. S., Ont. to Man.; S. to N. J. and Va.; W. to Colo., Neb., Minn. and Dak.

Minn. valley: Forest district; infrequent; openings and thickets.

HERB.: *Taylor* 336, Janesville; *Herb. Sheld.* 1932, Hen nepin Co.

Carex straminea WILLD. var. **mirabilis** (DEW.) TUCKM. Enum. Meth. 18 (1853).

C. mirabilis DEW. Sill. Journ. XXX, 63 (1836).

C. cristata var. *mirabilis* BOOTT, Ill. (1862).

C. lagopodioides var. *mirabilis* OLN. Exsicc. (1871).

Wats. and Coult., Gray's Man. 6 ed. 621; Coult., Fl. Colo. 396; Britt., Fl. N. J. 278; Mac., Fl. Can. II, 130; Webb., Fl. Neb. 98; Wats., Fl. Calif. II, 238 (?); Upham, Suppl. Minn. 86; Bail., Syn. Car. 150.

North America: Ont. to Man. and E. U. S. throughout; Yosemite valley?

Minn. valley: Forest district; abundant; openings and edges of thickets.

HERB.: *Ballard* 434, Prior's lake, Scott Co.; *Taylor* 734, Glenwood; *Ballard* 28, Chaska; *Ballard* 220, Jordan, Scott Co.; *Ballard* 847, Page lake, Carver Co.; *Bailey* 41, Vermilion lake.

Carex foenea WILLD. Enum. 957 (1809).

C. adusta Auct. Amer. Vet.

C. argyrantha TUCKM. Herb. Dietr. (1859).

C. albolutescens SCHWEIN. var. *argyrantha* OLN. Exsicc. I, 9 (1871).

C. adusta var. *argyrantha* BAIL. Cat. Car. (1884).

Wats. and Coult., Gray's Man. 6 ed. 621; Britt., Fl. N. J. 278; Mac., Fl. Can. II, 129; Wats., Fl. Calif. II, 238 (?); Bail., Typ. Car. 25; Upham, Fl. Minn. 155; Mac., Fl. Can. II, 377; Bail., Syn. Car. 150.

North America: N. Eng., Penn., N. J. to Mich., Minn., Man. and Brit. Col.

Minn. valley: Reported from N. E. districts; rare; rocky or sandy woodland.

Carex adusta BOOTT, Hook. Fl. Bor.-Am. II, 215 (1840).

C. albolutescens SCHWEIN. var. *glomerata* OLN. Exsicc. V, 10 (1871).

C. adusta var. *glomerata* BAIL. Car. Mon. 149 (1886).

C. pinguis BAIL. Bull. 3, G. and N. H. Surv. Minn. 22 (1887).

Wats. and Coult., Gray's Man. 6 ed. 621; Mac., Fl. Can. II, 129; Britt., Fl. N. J. 278; Coult., Fl. Colo. 397; Wats., Fl. Calif. II, 238; Bail., Typ. Car. 24; Upham, Fl. Minn. 155; Roth., Wheel. Exp. 277; Bail., Syn. Car. 148.

North America: N. Br., Maine, Mich., Minn., N. W. T. to Brit. Col., Rocky mts. and 57° N. lat.; S. to N. J.

Minn. valley: N. E. district, and perhaps forest district throughout; copses, thickets and barren or rocky woodland.

HERB.: *Bailey* 6, Vermilion lake; *Bailey* 530, Agate bay; *Bailey* 325, St. Louis river; *Bailey* 7, Vermilion; *Bailey* 464, Agate bay; *Bailey* 526, Agate bay; *Bailey* 283, St. Louis river; *Bailey* 558, Mud lake; *Kassube* 261, Minneapolis.

***Carex scoparia* SCHKR.** Car. Nachtr. (1801).

C. leporina MICHX. Fl. N. Am. I, 170 (1803).

C. scoparia var. *minor* BOOTT. Ill. 116 (1858).

C. lagopodioides var. *scoparia* BOECK. Linn. XXXIX, 114 (1875).

Wats. and Coult., Gray's Man. 6 ed. 620; Britt., Fl. N. J. 278; Coult., Fl. Colo. 396; Chap., Fl. S. St. 535; Bail., Typ. Car. 62; Upham, Fl. Minn., 155; Wats., Fl. Calif. II, 237 in var.; Bail., Syn. Car. 148.

North America: Newf., N. S., N. Br., Q., Ont. to Saskatchewan and L. Athabasca; S. to N. Eng., N. J. and S. Car.; W. to Iowa, Minn. and Mo.

Minn. valley: Throughout; principally in forest district; meadows and damp fields.

HERB.: *Sheldon* 1199, New Ulm; *Ballard* 548, Spring lake. Scott Co.; *Taylor* 523, Mud lake, Waseca Co. (var. *minor* Boott); *Bailey* 126, Vermilion; *Bailey* 301, St. Louis river; *Bailey* 492, Agate bay; *Bailey* 60, Vermilion lake; *Bailey* 8, Vermilion lake.

***Carex tribuloides* WAHL.** K. Acad. Handl. XXIV, 145 (1803).

C. lagopodioides SCHKR. Nachtr. 20 (1806).

C. scoparia var. *lagopodioides* TORR. Cyp. 394 (1836).

C. lagopodioides var. *composita* OLN. Exsicc. II, 10 (1871).

Wats. and Coult., Gray's Man. 6 ed. 620; Chap., Fl. S. St. 535; Mac., Fl. Can. II, 130; Wats., Fl. Calif. II, 237; Coult., Fl. Colo. 396; Bail., Typ. Car. 54; Webb., Fl. Neb. 98 in var.; Upham, Fl. Minn. 155; Cov., Fl. Ark. 231; Bail., Syn. Car. 148.

North America: N. Br., Q., Ont. to Saskatchewan; S. to N. Y., N. Eng., Penn., N. J. and mts. of N. Car.; W. to Minn. and Dak.; S. in Rockies to N. Mex.

Minn. valley: Forest district, especially eastward; damp, shady places.

HERB.: *Ballard* 16a, Zumbrota; *Ballard* 2a, Zumbrota; *Bailey* 270, Vermilion lake; *Bailey* 92, Vermilion lake; *Bailey*

35, Vermilion lake; *Bailey* 418, Long lake; *Bailey* 525, Agate bay; *Bailey* 184, Vermilion lake (all in var. *reducta* Bail.).

***Carex tribuloides* WAHL. var. *cristata* (SCHWEIN.) BAIL.** Syn. Car. 148 (1886).

C. cristata SCHWEIN. Ann. N. Y. Lyc. 66 (1824).

C. straminea var. *cristata* TUCKER. Enum. Meth. 18 (1843).

C. lagopodioides var. *cristata* Carey, Gray's Man. ed. 1, 545 (1848).

Wats. and Coult., Gray's Man. 6 ed. 620; Bail., Typ. Car. 55; Mac., Fl. Can. II, 130; Upham, Fl. Minn. 155; Britt., Fl. N. J. 278; Wats., Fl. Calif. II, 238; Coult., Fl. Colo. 396; Bail., Syn. Car. 148; Webb., Appx. Neb. 23.

North America: N. S., N. Br., Ont. to S. Man.; S. to Penn. and N. J.; W. to Minn. and E. Wyoming.

Minn. valley: Forest district; Ft. Snelling to Blue Earth Co.; wet meadows and damp fields.

HERB.: *Ballard* 218, Jordan, Scott Co. (var. *reducta* Bail.); *Taylor* 121, Janesville; *Sheldon* 333, Smith's mill, Blue Earth Co.; *Ballard* 433, Prior's lake, Scott Co. (all var. *reducta* Bail.); *Bailey* 259, Vermilion lake; *Sandberg* 538, Red Wing.

***Carex tribuloides* WAHL. var. *bebbii* (OLN.) BAIL.** Typ. Car. 55 (1889).

C. bebbii OLN. Exsicc. II, 12 (1870).

C. cristata UPHAM, Fl. Minn. 155 (1884) in part.

Wats. and Coult., Gray's Man. 6 ed. 620; Webb., Fl. Neb. 98; Mac., Fl. Can. II, 130; Britt., Fl. N. J. 278?

North America: Ont. to Man.; S. to N. Eng., N. Y., N. J.(?); W. to Minn., Dak. and Neb.

Minn. valley: S. central district; local or infrequent; habitat with the typical form.

***Carex muskingumensis* SCHWEIN.** An. Tab. (1823).

C. scoparia var. *muskingumensis* SCHWEIN. An. Tab. (1823).

C. arida SCHWEIN. and TORR. Car. Mon. 312 1824).

Wats. and Coult., Gray's Man. 6 ed. 620; Mac., Fl. Can. II, 129; Bail., Typ. Car. 71; Upham, Fl. Minn. 155.

North America: Man. to Minn., Wisc., Ill., Mich. and Ohio.

Minn. valley: N. E. district; infrequent; wet and marshy meadows.

HERB.: *Sandberg* 537, Center City.

***Carex siccata* DEW.** Sill. Journ. X, 278 (1826).

C. pallida C. A. MEY. Cyp. Nov. 21 (1830).

C. liddoni CAREY, Gray's Man. ed. 1, 545 (1848).

Wats. and Coult., Gray's Man. 6 ed. 619; Mac., Fl. Can. II, 114; Coult., Fl. Colo. 392; Wats., Fl. Calif. II, 230; Upham, Fl. Minn. 153; Wats., King Exp. 363; Roth., Wheel. Exp. 276; Engl. Pax, Nat. Pflanz. II, 2, 124; Bail., Syn. Car. 147; Led., Fl. Ross. IV.

North-eastern Asia.

North America: Ont. to L. Superior region, Man., Saskatchewan, N. W. T., Brit. Col. and Rocky mts.; S. to N. Eng.; W. to Ohio, Mich. and Minn.; Colo., Sacramento valley and Columbia river region.

Minn. valley: Reported from forest district; rare; dry and sandy places.

Carex deweyana SCHWEIN. An. Tab. (1823).

C. remota RICH. Appx. Frankl. (1823) not Linn.

Wats and Coult., Gray's Man. 6 ed. 619; Coult., Fl. Colo. 394; Mac., Fl. Can. II, 124; Wats., Fl. Calif. II, 236; Bail., Typ. Car. 71; Upham, Fl. Minn. 155; Bail., Syn. Car. 146.

North America: N. Br., Q., Ont. to Man. and Brit. Col. and Rocky mts.; S. to Colo., Calif. and N. Mex.

Minn. valley: Forest district; thickets, dry woodland and river banks.

HERB.: *Bailey* 37, Vermilion lake.

Carex trisperma DEW. Sill. Journ. IX, 63 (1825).

Wats. and Coult., Gray's Man. 6 ed. 619; Mac., Fl. Can. II, 122; Britt., Fl. N. J. 278; Webb., Fl. Neb. 98; Upham, Fl. Minn. 154; Chap., Suppl. S. St. 660; Bail., Syn. Car. 144.

North America: N. S., Q., Ont. to L. Superior and Rocky mts.; S. to N. Eng., N. J., Penn. and N. Car.; W., around Gt. Lakes, to Iowa and Minn.

Minn. valley: Reported from N. E. district; cold swamps and bogs.

HERB.: *Juni* 21, Put In-Bay; *Bailey* 91, Vermilion.

Carex tenuiflora WAHL. Act. Holm. 146 (1803).

Wats. and Coult., Gray's Man. 6 ed. 619; Upham, Fl. Minn. 154; Mac., Fl. Can. II, 122; Richt., Pl. Eur. 151; Herd., Fl. Eur. Russ. 146; Bail., Syn. Car. 145; Hart., Fl. Scand. I, 473.

N. Europe and Siberia.

North America: N. Br. to S. Man.; S. to N. N. Eng. and S. Minn.

Minn. valley: N. E. district; swamps and cold bogs.

HERB.: *Bailey* 281, St. Louis river; *Sandberg* 532, Chisago Co.; *Herrick* 335, Minneapolis.

Carex canescens LINN. Spec. 974 (1753).

C. brizoides HUDS. Fl. Angl. 406 (1762).

C. elongata LEERS. Fl. Herb. 14 (1775).

C. cinerea PALL. Pl. Palat. II, 571 (1777).

C. richardii THUILL. Fl. Par. 482 (1790).

C. curta GOODEN. Trans. Linn. Soc. II, 145 (1792).

Vignea canescens REICH. Fl. Exc. 58 (1830).

V. persooni SCHUR. Verh. S. V. III, 169 (1852).

Carex vitilis var. *pallida* OLN. King Exp. V, 364 (1871).

Wats. and Coult., Gray's Man. 6 ed. 618; Mac., Fl. Can. II, 123; Chap., Fl. S. St. 535; Coult., Fl. Colo. 394; Bail., Typ. Car. 64; Wats., Fl. Calif. II, 236; Britt., Fl. N. J. 278; Upham, Fl. Minn. 154; Richt., Pl. Eur. 151; Herd., Fl. Eur. Russ. 140; Hook., Fl. Gt. Brit. 452; Roth., Wheel. Exp. 278; Engl. Pax, Nat. Pflanz. II, 2, 124; Bail., Syn. Car. 143; Rothr., Alask. 457.

Europe; N. Asia; S. Chile.

North America: Greenland, Hudson Bay, Mackenzie valley to Sitka, Alaska; S. to N. Eng., Penn., N. J.; W. to Minn. and Colo.

Minn. valley: Forest district; Ft. Snelling to Blue Earth Co.; marshes and wet meadows.

HERB.: *Sandberg* 533, Center City.

***Carex echinata* MURR. var. *radiata* (WAHL.) B. S. P. Cal. N. Y. (1888).**

Carex stellulata var. *radiata* WAHL. K. Acad. Handl. XXIV, 147 (1803).

C. scirpoides SCHKR. Car. 19 (1805).

C. sterilis WILLD. Spec. IV, 208 (1805).

C. sterilis vars. *B.* and *G.* TORR. Cyp. 392 (1836).

C. stellulata vars. *scirpoides* and *angustata* CAREY, Gray's Man. ed. I, 544 (1848).

C. echinata var. *microstachys* BOECK. Linn. XXXIX, 125 (1875).

C. echinata and var. *microcarpa* UPHAM, Fl. Minn. 155 (1884).

C. echinata var. *microcarpa* BAIL. Coult. Fl. Colo. 395 (1885).

C. echinata var. *angustata* BAIL. Car. Cat. (1884).

Wats. and Coult., Gray's Man. 6 ed. 618; Mac., Fl. Can. II, 126; Wats., Fl. Calif. II, 237; Bail., Typ. Car. 58; Britt., Fl. N. J. 277; Coult., Fl. Colo. 395; Bail. Syn. Car. 58; Upham, Fl. Minn. 155; Roth., Wheel. Exp. 277; Cov., Fl., Ark. 237; Engl. Pax, Nat. Pflanz. II, 2, 124.

North America: N. S., N. Br., Q., Ont. to Sitka, Alaska; S. to N. Y., N. J., Penn. and Fla.; W. to Oregon and Colo.

Minn. valley: Forest district; marshes and wet places, or swamps.

HERB.: *Ballard* 153, Chaska, Carver Co.; *Sandberg* 536, Center City; *Bailey* 482, Agate Bay.

***Carex cephalophora* MUHL. Willd. Spec. IV (1805).**

Wats. and Coult., Gray's Man. 6 ed. 617; Mac., Fl. Can. II, 118; Bail., Typ. Car. 61; Chap., Fl. S. St. 534; Coult., Fl. Colo. 389; Upham, Fl. Minn. 154; Britt., Fl. N. J. 277; Cov., Fl. Ark. 231; Engl. Pax, Nat. Pflanz. II, 2, 123; Bail., Syn. Car. 141.

North America: Ont., N. Y., N. J., to Fla.; W. to Minn., Iowa, Mo., Ark. Ind. Terr. and Mex.

Minn. valley: Forest district; Ft. Snelling to Blue Earth Co.; woods and fields.

HERB.: *Sandberg* 528, Minneapolis; *Herrick* 324, Minneapolis.

Carex muhlenbergii SCHKR. Nachtr. XII, 178 (1806).

C. pinetorum SCHLECHT. Linn. X, 265 (1836).

Wats. and Coult., Gray's Man. 6 ed. 617; Coult., Fl. Colo. 389; Mac., Fl. Can. II, 118; Chap., Fl. S. St. 534; Bail., Typ. Car. 62; Upham, Fl. Minn. 154; Britt., Fl. N. J. 277; Cov., Fl. Ark. 231; Bail., Syn. Car. 140; Webb., Appx. Neb. 23.

North America: Ont. to Hudson Bay; S. to N. Y., N. J., Penn. and S. Car.; W. to Minn., Dak. and Neb.

Minn. valley: Reported from N. E. district; rare or doubtful; fields and meadows.

Carex rosea SCHKR. Nachtr. XV, 179 (1806).

Wats. and Coult., Gray's Man. 6 ed. 616; Webb., Fl. Neb. 98; Mac., Fl. Can. II, 119; Britt., Fl. N. J. 276; Upham, Fl. Minn. 154; Bail., Typ. Car. 62, 69; Chap., Fl. S. St. 534; Coult., Fl. Colo. 389; Cov., Fl. Ark. 231; Bail., Syn. Car. 139.

North America: Newf., N. S., N. Br., Q., Ont., Owen Sound and Man.; S. to N. Y., N. J. and N. Ga.; W. to Minn., Neb. and Ind. Terr.?

Minn. valley: Forest district; perhaps westward; moist woodland and wet fields.

HERB.: *Sheldon* 145, Madison Lake; *Taylor* 147, Janesville; *Taylor* 202, Janesville; *Ballard* 6, Chaska; *Ballard* 7a, Goodhue Co.; *Sandberg* 529, Center City; *Kassube* 259, Minneapolis; *Herb. Sheld.* 1930, Hennepin Co.

Carex rosea SCHKR. var. **radiata** DEWEY. Sill. Journ. X, 276 (1826).

C. neglecta TUCKER. Enum. Meth. 19 (1843).

C. rosea var. *minor* BOOTH, Ill. 81 (1858).

Wats. and Coult., Gray's Man. 6 ed. 615; Mac., Fl. Can. II, 119; Coult., Fl. Colo. 389; Britt., Fl. N. J. 276; Chap., Fl. S. St. 534; Upham, Suppl. Minn. 86.

North America: Ranges with the type and to Ind. Terr., and Mexico.

Minn. valley: Reported from S. E. and S. central district; habitat with the typical form.

Carex tenella SCHKR. Car. I, 23 (1801).

C. disperma DEW. Sill. Journ. VIII, 266 (1824).

C. blytii NYL. Spic. Fenn. II, 35 (1843-46).

C. gracilis GRAY, Sill. Journ. IV, 22 (1847).

Wats. and Coult., Gray's Man. 6 ed. 616; Mac., Fl. Can. II, 121; Coult., Fl. Colo. 389; Wats., Fl. Calif. II, 235; Britt., Fl. N. J. 276; Upham, Fl. Minn. 154; Herd., Fl. Eur. Russ. 146; Nym., Fl. Eur.; Richt. Pl. Eur. 151; Wats., King Exp. 364; Roth., Wheel. Exp. 277; Bail., Syn. Car. 139; Hart., Fl. Scand. I, 473.

Northern Europe.

North America: Atl. to Pac in Can., and N. to lat. 56° on Peace river; S. to N. Eng., Penn. and N. J.; W. to Oregon, Utah and N. Mex.

Minn. valley: Forest district; swamps, and cold peat bogs.

HERB.: *Ballard* 152, Chaska, Carver Co.; *Bailey* 30, Vermilion lake; *Kassube* 260, Minneapolis.

Carex sartwellii DEW. Sill. Journ. XLIII, 90 (1868).

C. intermedia DEW. Sill. Journ. IV, 343 (1847) in part.

C. disticha SARTW. Exsicc. 71 (1848).

C. disticha var. *sartwellii* DEW. Sill. Journ. XLI, 330 (1866).

Wats. and Coult., Gray's Man. 6 ed. 615; Mac., Fl. Can. II, 114; Wats., Fl. Calif. II, 230; Bail., Typ. Car. 8; Coult., Fl. Colo. 392; Upham, Fl. Minn. 153; Herd., Fl. Eur. Russ. 138?; Mac., Fl. Can. II, 373; Wats., King Exp. 362; Bail., Syn Car. 137; Webb., Appx. Neb. 23.

N. E. Asia?

North America: Newf., Ont., C. N. Y. to Minn., Saskatchewan, Brit. Col. and Rockies; S. to Utah and Colo.

Minn. valley: N. E. districts; rare or local; dry or waste places and prairies or openings in forest,

HERB.: ? *Kassube* 257, Minneapolis,

Carex vulpinoidea MICHX. Fl. N. Am. I, 69 (1803).

C. multiflora MUHL. Willd. Spec. V, (1805).

C. bracteosa SCHRW. An. Tab. (1823).

C. setacea DEW. Sill. Journ. IX, 61 (1825).

C. multiflora var. *microsperma* DEW. Sill. Journ. XI, 317 (1826).

C. vulpinaeformis TUCKER. Enum. Meth. 9 (1843).

C. scabrior SARTW. Dew., Sill. Journ. VIII, 349 (1849).

Wats. and Coult., Gray's Man. 6 ed. 615; Britt., Fl. N. J. 276; Webb., Fl. Neb. 98; Bail., Typ. Car. 61; Mac., Fl. Can. II, 115; Upham, Fl. Minn. 153; Coult., Fl. Colo. 392; Roth, Wheel. Exp. 277; Cov., Fl. Ark. 232; Bail., Syn. Car. 136.

North America: N. Br., Q., Ont. to Nelson river valley; S. to Minn., Iowa, Neb., Colo., Ark., and E. to N. Eng., Penn. and N. J.

Minn. valley: Throughout; low meadows; abundant.

HERB.: *Taylor* 515, Mud lake, Waseca Co.; *Taylor* 681, Glenwood; *Taylor* 381, Janesville; *Sheldon* 1308, Lake Benton; *Ballard* 219, Jordan, Scott Co.; *Ballard* 14a, Goodhue Co.; *Juni* 19, Minneapolis; *Sandberg* 524, Chisago Co.; *Sandberg* 525, Red Wing.

Carex grvida BAIL. Typ. Car. 5 (1889).

C. cephaloidea SARTW. Exsicc. 75 (1848).

Wats. and Coult., Gray's Man. 6 ed. 615; Mac., Fl. Can. II, 118; Webb., Fl. Neb. 98; Coult., Fl. Colo. 390; Upham, Fl. Minn. 154.

North America: Ont. to N. Ill., Iowa, S. Minn and Dak. and E. Neb. and Wyoming.

Minn. valley: Forest district; low meadows and fields.

HERB.; *Taylor 169*, Janesville.

***Carex gravida* BAIL. var. *laxifolia* BAIL.** Typ. Car. 6 (1889).

Webb., Appx. Neb. 23; Wats. and Coult., Gray's Man. ed. 6, 615.

Minn. valley: Forest district; low, wet meadows and moist fields.

HERB.: *Taylor 514*, Mud lake, Waseca Co.; *Taylor 504*, Minnesota Lake.

***Carex teretiuscula* GOODEN.** Trans. Linn. Soc. II, 163 (1794).

C. diandra SCHKR. Baier. Fl. 281 (1789).

C. paniculata var. *teretiuscula* WAHL. Konigl. Acad. Handl. XXIV. 140 (1803).

Vigna teretiuscula REICH. Fl. Exc. 60 (1830).

Carex teretiuscula var. *major* KOCH, Fl. Germ. 867 (1837).

Wats. and Coult., Gray's Man. 6 ed. 614; Mac., Fl. Can. II, 116; Britt., Fl. N. J. 276; Upham, Fl. Minn. 153; Herd., Fl. Eur. Russ. 140; Richt., Pl. Eur. 150; Trautv. Fl. Sib. 124; Led., Fl. Ross. IV. 76; Hook., Fl. Gt. Brit. 450; Engl. Pax, Nat. Pflanz. II, 2, 124; Bail., Syn. Car. 136; Hart., Fl. Scand. I, 478.

Middle and Northern Europe; Asia to Himalaya mts.; N. Zealand.

North America: N. S., N. Br., Q., Ont., Man., Saskatchewan, Brit. Col. to Vancouver; S. to N. Eng., N. J., Penn.; W. to Minn. and Dak.

Minn. valley: Forest district, not infrequent; swamps and marshes.

HERB.: *Taylor 86*, Lake Custin, Le Sueur Co.; *Sandberg 523*, Goodhue Co.

***Carex teretiuscula* GOODEN. var. *ramosa* BOOTT,** Ill. 145 (1858).

C. paradoxa BOOTT, Hook. Fl. II, 213 (1840).

C. prairea DEW. Wood's Bot. 750 (1861).

Wats. and Coult., Gray's Man. 6 ed. 615; Mac., Fl. Can. IV, 116; Upham, Fl. Minn. 153; Bail., Syn. Car. 136.

North America: N. Y. to Minn., Saskatchewan, Dak., Man., L. Athabasca, Rocky mts., valley of the Columbia and Vancouver.

Minn. valley: Reported from S. and S. E. districts; infrequent; wet places, swamps or marshes.

Carex crus-corvi SHUTTLEW. Kunze, Riedgr. Suppl. 128 (1850).

C. siccaeformis BOOTT, Jour. Bost. Nat. Hist. Soc. V, 113 (1847).

C. halei DEWEY, Sill. Journ. Ser. 2, II, 248 (1846).

Wats. and Coult., Gray's Man. 6 ed. 614; Bail., Typ. Car. 72; Chap., Fl. S. St. 533; Webb., Fl. Neb. 98; Coult., Fl. Colo. 391; Upham, Fl. Minn. 153; Engl. Pax, Nat. Pflanz. II, 2, 124; Bail., Syn. Car. 135.

North America: S. Minn. to Neb., Ind. Terr. and Mex.; E. to Ky., Tenn. and W. Fla.

Minn. valley: S. E. and S. central district; swamps and springs in forest.

HERB.: *Sandberg 526*, Red Wing.

Carex stipata MUHL. Cat. (1805).

C. vulpinoidea TORR. Fl. N. Amer. (1836).

C. stipata var. *maxima* CHAP. Fl. S. St. 533 (1861).

C. crus-corvi SOMM. Cat. N. S. Pl. (? 1872).

Wats. and Coult., Gray's Man. 6 ed. 614; Mac., Fl. Can. II, 117; Bail., Typ. Car. 61, 62; Coult., Fl. Colo. 391; Britt., Fl. N. J. 276; Chap., Fl. S. St. 533; Upham, Fl. Minn. 153; Wats., King Exp. 362; Cov., Fl. Ark. 231; Bail., Syn. Car. 135; Webb., Appx. Neb. 23.

North America: Newf., N. S., N. Br., Q., Ont., Man., Saskatchewan, Brit. Col., Vancouver; S. in Rockies to Tex. and Mex.; N. Eng., N. J., Penn. to Fla. and Miss.; W. to Minn., Dak., Neb. and Mont.

Minn. valley: Forest district; abundant; low meadows and fields.

HERB.: *Taylor 132*, Lake Elysian; *Ballard 5*, Chaska; *Sheldon 105a*, Elysian; *Taylor 21*, Elysian; *Taylor 161*, Janesville; *Ballard 11a*, Zumbrota; *Sandberg 527*, Center City, Chisago Co.; *Bailey 621*, Agate Bay.

Carex conjuncta BOOTT, Ill. Car. 122 (1862).

C. vulpina CAREY, Gray's Man. ed. I, 512 (1848).

Wats. and Coult., Gray's Man. 6 ed. 614; Upham, Fl. Minn. 153; Bail., Syn. Car. 134.

North America: N. J. and Ky. to Minn. and Mo.

Minn. valley: N. E. district; local; low meadows or fields.

HERB.: ? *Kassube 258*, Minneapolis.

Carex stenophylla WAHL. Act. Holm. 142 (1801).

C. juncifolia HOST. Syn. 504 (1797).

C. glomerata HOST. Gram. I, 32 (1801).

C. hostii SCHKR. Car. I, 26 (1801).

Vigneia stenophylla REICH. Fl. Exc. 56 (1830).

Carex duriuscula C. A. MEY. Cyp. Nov. 214 (1831).

C. pachystylis GAY, Ann. Sci. Nat. 2 ser. X, 301 (1838).

C. deinbolliana GAY, Ann. Sci. Nat. 2 ser. XI, 183 (1839).

Wats. and Coult., Gray's Man. 6 ed. 614; Mac., Fl. Can. II. 120; Webb., Fl. Neb. 98; Coult., Fl. Colo. 391; Upham, Suppl. Minn. 49; Herd., Fl. Eur. Russ. 138; Richt., Pl. Eur. 148; Roth., Wheel. Exp. 277; Bail., Syn. Car. 133.

Europe (region of the Caucasus mts. and the Carpathians).

North America: Colo. to N. Mex.; E. to Neb., Iowa; N. to Minn., Saskatchewan and Rocky mts. in Peace river valley region.

Minn. valley: Reported from S. and N. W. districts; wet prairies.

Carex chordorhiza EHRH. Linn. f. Suppl. 414 (1781).

C. uniformis CLAIRV. Man. 287 (1811).

Vignea chordorhiza REICH. Fl. Exc. 56 (1830).

Carex fulvicoma DEW. Sill. Journ. XXIX, 249 (1836).

C. chordorhiza var. *genuina* TRAUTV. Act. Hort. Petr. V, 123 (1877).

Wats. and Coult., Gray's Man. 6 ed. 614; Mac., Fl. Can. II, 120; Upham, Fl. Minn. 154; Herd. Fl. Eur. Russ. 138; Richt., Pl. Eur. 148; Trautv. Fl. Sib. 123; Led., Fl. Ross. IV, 271; Engl. Pax, Nat. Pflanz. II, 2, 123; Bail., Syn. Car. 133; Hart., Fl. Scand. I, 477.

Europe and Russian Empire.

North America: Anticosti, N. Br., Q., Ont. to Man., Saskatchewan, Brit. Col., lat. 54° N. and Hudson Bay; S. to Vt. and W. to Minn. and Iowa.

Minn. valley: Forest district; rare; bogs and springs.

HERB.: *Sandberg 530*, Red Wing.

Carex polytrichoides MUHL. Willd. Spec. II, 4 (1802).

C. leptalea WAHL. K. Acad. Handl. XXIV, 139 (1803).

C. microstachya MICHX. Fl. N. Am. II, 169 (1803).

Wats. and Coult., Gray's Man. 6 ed. 613; Britt., Fl. N. J. 276; Bail., Typ. Car. 61, 64; Bail., Syn. Car. 131; Chap., Fl. S. St. 536; Coult., Fl. Colo. 378; Mac., Fl. Can. II, 111; Upham, Fl. Minn. 153; Roth., Wheel. Exp. 276.

North America: Newf., N. S., N. Br., Q., Ont., Man. to Selkirk mts. and Brit. Col. to Vancouver; N. to Hudson Bay; S. to Minn., Col.; E. to N. Eng., N. J. and Fla.

Minn. valley: N. E. districts and N. edge; rare; low grounds and marshes.

HERB.: *Juni 18*, Little Marais; *Bailey 316*, Vermilion lake; *Bailey 29*, Vermilion lake.

Carex pubescens MUHL. Willd. Spec. IV, 28 (1805).

Wats. and Coult., Gray's Man. 6 ed. 613; Bail., Typ. Car. 61; Mac., Fl. Can. II, 161; Britt., Fl. N. J. 276; Upham, Fl. Minn. 157; Coult., Fl. Colo. 377; Bail., Syn. Car. 127.

North America: Newf., N. Br., Ont. to N. Eng., N. J., Ky., and W. to Minn., Dak. and Mo.

Minn. valley: Forest district; Ft. Snelling to Blue Earth Co.; damp woods and openings; meadows or hills.

HERB.: *Kassube* 267, Ramsey Co.

Carex pennsylvanica LAM. Enc. Meth. III (1789).

C. marginata MUHL. Willd. Spec. IV, 261 (1805).

C. lucorum WILLD. Hort. Berol. Suppl. 63 (1809)

Wats. and Coult., Gray's Man. 6 ed. 612; Bail., Typ. Car. 61, 62; Mac., Fl. Can. II, 158; Britt., Fl. N. J. 275; Wats., Fl. Calf. II, 246; Chap. Fl. S. St. 539; Coult., Fl. Colo. 374; Upham, Fl. Minn. 157; Bail., Syn. Car. 122; Webb., Appx. Neb. 23.

North America: N. Br., Q., Ont. to Man., Brit. Col. and Vancouver; S. to N. Eng., N. J. and Ga.; W. to Minn., Dak. and Mo.; S. to Colo. in mts. and to California (?).

Minn. valley: Forest district; common; dry woods and thickets; hillsides and meadows

HERB.: *Sheldon* 55, Hennepin Co.; *Sheldon* 1619, Minneapolis; *Ballard* 17a, Zumbrota; *Kassube* 265, Minneapolis.

Carex varia MUHL. Wahl. K. Acad. Handl. XXIV, 159 (1803).

C. alpestris DEW. Sill. Journ. VII, 268 (1824).

C. davisii DEW. 1. c. X, 279 (1826).

C. albicans "WILLD. in herb." Spreng. Syst. Veg. III, 818 (1826).

C. emmonsii DEW. Torr., Mon. Car. 411 (1836).

C. novae-angliae var. *emmonsii* CAREY, Gray's Man. ed. 1, 556 (1848).

C. lucorum var. *emmonsii* CHAP. Fl. S. St. 539 (1860).

C. emmonsii var. *elliptica* BOOTT, Ill. 97, 287 (1860).

Wats. and Coult., Gray's Man. 6 ed. 611; Britt., Fl. N. J. 275; Bail., Typ. Car. 40; Chap., Fl. S. St. 539; Mac., Fl. Can. II, 159; Coult., Fl. Colo. 375; Mac., Fl. Can. II, 384; Cov., Fl. Ark. 232; Bail., Syn. Car. 123.

North America: N. S., N. Br., Q., Ont. to lat. 55° N., Brit. Col.; S. to N. Car. and Fla.; W. to Minn., Mo. and Ind. Terr.

Minn. valley: Forest district; S. central section; wooded hills and thicket edges.

Carex pedunculata MUHL. Willd. Spec. IV (1805).

Wats. and Coult., Gray's Man. 6 ed. 610; Mac., Fl. Can. II, 157; Bail., Typ. Car. 61; Britt., Fl. N. J. 275; Upham, Fl. Minn. 157; Bail., Syn. Car. 120.

North America: N. Br., Q., Ont. to Man. and Rocky mts.; S. to N. Eng., N. J. and Va.; W. to Minn. and Iowa.

Minn. valley: Central S. district; woods and shaded banks.

HERB.: *Leiberg* 87, Blue Earth Co.

Carex richardsoni R. BR. Appx. Frankl. Narr. 723 (1823).

Wats. and Coult., Gray's Man. 6 ed. 610; Bail., Typ. Car. 68; Mac., Fl. Can. II, 158; Wats., Fl. Calif. II, 246; Upham, Fl. Minn. 157; Coult., Fl. Colo. 376; Bail., Syn. Car. 122.

North America: Newf., Ont., lat. 54° N., Brit. Col N. W. coast of Can.; S. to W. N. Y., Ill., Minn., Mont. and Calif.

Minn. valley: Forest district; Ft. Snelling to Blue Earth Co.; dry fields or hillsides.

HERB.: *Kassube* 266, Minneapolis; *Sandberg* 547, Red Wing.

Carex eburnea BOOTT, Hook. Fl. Bor.-Am. II, 226 (1840).

C. alba DEW. Sill. Journ. VII, 266 (1824).

C. alba var. *setifolia* DEW. Sill. Journ. XI, 316 (1826).

C. paupercula TORR. Cyp. 415 (1836).

Wats. and Coult., Gray's Man. 6 ed. 610; Mac., Fl. Can. II, 157; Webb., Fl. Neb., 98; Upham, Fl. Minn. 157; Britt., Fl. N. J. 275; Bail., Syn. Car. 120.

North America: N. Br., Q., Ont. to Man., Rocky mts. and lat. 56° on Mackenzie river; S. to N. Eng., N. J., Penn. Ky., Ind., Minn., Iowa and Neb.

Minn. valley: Central S. district; rocky ledges

HERB.: *Leiberg* 86, Blue Earth Co.

Carex aurea NUTT. Gen. II, 205 (1818).

C. mutica R. BR. Appx. Frankl. Narr. 763 (1823).

C. pyriformis SCHWEIN. An. Tab. (1823).

C. aurea var. *androgyna* OLN. Exsicc. I, 15 (1870).

C. concinna OLN. Bot. King Exp. 372 (1871).

Wats. and Coult., Gray's Man. 6 ed. 610; Mac., Fl. Can. II, 138; Coult., Fl. Colo. 378; Upham, Fl. Minn. 156; Wats., Fl. Calif. II, 240; Wats., King Exp. 371; Roth., Wheel. Exp. 278; Bail., Syn. Car. 119; Webb., Appx. Neb. 23.

North America: Newf., N. S., N. Br., Q., Ont. to Man., Saskatchewan, Brit. Col., Pelly river, lat. 63° N.; S. to N. Eng., N. Y. and Penn.; W. to Minn., Dak. and Colo.; S. in Rockies to Arizona and N. Mex., in Sierras to California, Utah and Nevada.

Minn. valley: N. E. district; wet banks and grassy places along streams and around ponds.

HERB.: *Holway* 30, Vermilion lake; *Oestlund* 218, Minneapolis.

Carex tetanica SCHKUHR, var. **meadii** (DEW.) BAIL. Syn. Car. 118 (1886).

C. meadii DEW. Sill. Journ. XLIII, 90 (1842).

C. panicea var. *meadii* OLN. Exsicc. I, 24 (1870).

C. panicea var. *canbyi* OLN. Exsicc. II, 24 (1871).

Wats. and Coult., Gray's Man. 6 ed. 609; Mac., Fl. Can. II, 152; Upham, Fl. Minn. 156; Coult., Fl. Colo. 379; Webb., Fl. Neb. 98.

North America: R. I. to Minn. and Assiniboia; S. to Neb. and Colo. to Tex.

Minn. valley: N. E. district; woods and river banks.

HERB.: ?*Kassube* 276, Minneapolis.

Carex laxiflora LAM. Enc. Meth. III, 392 (1789).

C. striatula MICHX. Fl. N. Am. I, 173 (1803).

C. conoidea MUHL. Diss. Gram. 248 (1817).

C. anceps SCHWEIN. and TORR. Mon. 343 (1825) in part.

C. blanda DEW. Sill. Journ. X, 45 (1826).

C. anceps var. *blanda* HOOK. Fl. Bor.-Am. II, 226 (1840).

C. anceps var. *striatula* CAREY, Gray's Man. ed. 1, 554 (1848).

C. ignota DEW. Sill. Journ. VIII, 348 (1849).

C. laxiflora var. *striatula* CAREY, Gray's Man. ed. 2, 524 (1852).

Wats. and Coult., Gray's Man. 6 ed. 607; Mac., Fl. Can. II, 155; Britt., Fl. N. J. 274; Webb., Fl. Neb. 98; Upham, Fl. Minn. 157; Chap., Fl. S. St. 540; Mac., Fl. Can. II, 382; Cov., Fl. Ark. 231; Bail., Syn. Car. 114.

North America: Ont. to N. Eng., N. J. and Fla.; W. to Minn. and Mo.

Minn. valley: Forest district; Ft. Snelling to Blue Earth Co.; wet meadows; infrequent.

HERB.: *Sandberg* 546, Red Wing.

Carex flava LINN. Spec. 975 (1753) var. **viridula** (MICHX.) BAIL. Typ. Car. 31 (1889).

C. viridula MICHX. Fl. N. Am. II, 170 (1803).

C. irregularis SCHWEIN. An. Tab. (1823).

C. oederi SCHWEIN. and TORR. Mon. Car. 334 (1825).

? *C. demissa* HORNEM. Spreng. Syst. III, 822 (1826).

Wats. and Coult., Gray's Man. 6 ed. 606; Mac., Fl. Can. II, 140; Britt., Fl. N. J. 273; Bail., Syn. Car. 111; Upham, Fl. Minn. 158; Richt., Pl. Eur. 164 (spec.); Herd., Fl. Eur. Russ. 140 (spec.); Hook., Fl. Gt. Brit. 461 (spec.); Cov., Fl. Ark. 231; Engl. Pax, Nat. Pflanz. II, 2, 125; Hart., Fl. Scand. I, 459 (spec.).

North America: Greenland, N. S., N. Br., Q., Ont., Man. to Brit. Col., Vancouver and Hudson Bay; S. to N. Eng., Penn., N. J.; W. to Minn., Dak. and Mont.

Minn. valley: N. E. district; rare; wet places and in rocky soil.

HERB.: *MacM.* and *Sheld.*, Brainerd (var. *graminis* Bail.).

Carex crawei DEW. Torr., Bot. N. Y. II, 408 (1843).

C. heterostachya TORR. Sill. Journ. II, 248 (1846).

C. crawei var. *heterostachya* DEW. Sill. Journ. XLII, 4 (1866).

Wats. and Coult., Gray's Man. 6 ed. 606; Mac., Fl. Can. II, 153; Upham, Fl. Minn. 157; Bail., Syn. Car. 110.

North America: Anticosti, Ont., Owen Sound and Man. to N. Y., Ill. and Minn.

Minn. valley: S. central district; peat bogs and wet places in forest.

Carex granularis MUHL. Willd. Spec. V (1806).*C. chalaros* STEUD. Cyp. 231 (1855).*C. haleana* OLN. Exsicc. III, 14 (1871).

Wats. and Coult., Gray's Man. 6 ed. 605; Mac., Fl. Can. II, 153; Britt., Fl. N. J. 273; Chap., Fl. S. St. 540; Bail., Typ. Car. 61, 70; Bail., Syn. Car. 110.

North America: Ont., Q., to L. Nipigon and Man.; S. to N. Eng., N. J., Va., Fla.; W. to Wisc., Minn. and Mo.

Minn. valley: Forest district; not infrequent; wet fields and meadows.

HERB.: *Taylor* 70, Elysian; *Kassube* 263, Minneapolis; *Sandberg* 543, Chisago Co.

Carex grisea WAHL. K. Acad. Handl. XXIV, 154 (1802).*C. laxiflora* SCHKUHR, Car. Nachtr. 69 (1805).*C. grisea* var. *minor* OLN. Hall's Pl. Tex. 26 (1873).

Wats. and Coult., Gray's Man. 6 ed. 605; Mac., Fl. Can. II, 154; Webb., Fl. Neb. 98; Britt., Fl. N. J. 273; Chap., Fl. S. St. 539; Coult., Fl. Colo. 378; Bail., Typ. Car. 61, 62; Cov., Fl. Ark. 231; Bail., Syn. Car. 107.

North America: Ont. to N. Y., N. J. and Fla.; W. to 100th Mer. and in S. Utah.

Minn. valley: Forest district; low meadows and fields.

HERB.: *Ballard* 339, Jordan, Scott Co.; *Sheldon* 33, Elysian; *Taylor* 128, Lake Elysian; *Taylor* 216, Janesville; *Ballard* 20a, Goodhue Co.; 21a, Goodhue Co.; 15a, Goodhue Co.

Carex davisii SCHWEIN. and TORR. Mon. 326 (1825).*C. aristata* DEW. Sill. Journ. VII, 277 (1824).*C. torreyana* DEW. Sill. Journ. X, 47 (1826).

Wats. and Coult., Gray's Man. 6 ed. 605; Britt., Fl. N. J. 273; Chap., Fl. S. St. 538; Coult., Fl. Colo. 380; Upham, Fl. Minn. 157; Bail., Syn. Car. 107.

North America: W. Mass. to N. J. and mts. of Ga.; W. to S. Minn. and Iowa.

Minn. valley: Reported from N. E. districts and westward; infrequent; wet grounds along streams and around lakes.

Carex gracillima SCHWEIN. An. Tab. (1823).*C. digitata* SCHWEIN. and TORR. Mon. 324 (1825).

Wats. and Coult., Gray's Man. 6 ed. 604; Mac., Fl. Can. II, 137; Chap., Fl. S. St. 538; Britt., Fl. N. J. 273; Upham, Fl. Minn. 157; Bail., Typ. Car. 71; Bail., Syn. Car. 106.

North America: N. S., Q., Ont. to Man.; S. to N. Eng., N. J. and N. Car.; W. to Minn. and Mo.

Minn. valley: Forest district; Ft. Snelling to Blue Earth Co.; wet meadows and low fields or prairies.

HERB.: *Kassube* 264, Minneapolis; *Sandberg* 545, Chisago Co.

Carex arctata BOOTT, Hook. Fl. II, 227 (1840).*C. sylvatica* DEW. Sill. Journ. X, 40 (1826), not Huds.

Wats. and Coult., Gray's Man. 6 ed. 603; Mac., Fl. Can. II, 161; Upham, Fl. Minn. 157; Britt., Fl. N. J. 273; Coult., Fl. Colo. 380.

North America: N. Br., Q., Ont. to N. Eng. and N. J.; W. to Penn., Minn., Colo. and Mont.

Minn. valley: Throughout; woods and dry thickets.

HERB.: *Sheldon 163*, Madison lake; *Taylor 906*, Glenwood; *Bailey 211*, Vermilion lake; *Bailey 556*, Mud lake.**Carex castanea** WAHL. K. Acad. Handl. XXIV, 155 (1803).*C. flexilis* RUDGE, Linn. Trans. VII, 98 (1804).*C. blepharophora* GRAY, Ann. Lyc. N. Y. III, 237 (1836).

Wats. and Coult., Gray's Man. 6 ed. 603; Bail., Typ. Car. 60; Mac., Fl. Can. II, 162, 386; Upham, Fl. Minn. 158.

North America: Newf., L. Nipigon to Minn.; S. to Conn. and Mich.

Minn. valley: N. E. edge; banks of streams; infrequent.

HERB.: *Bailey 557*, Long lake; *Sandberg 619*, Vermilion lake; *Juni 28*, Knife river.**Carex longirostris** TORR. Schwein. An. Tab. (1823).*C. sprengelii* DEW. Spreng. Syst. III, 827 (1826).*C. longirostris* var. *minor* BOOTT, Phil. Acad. 78 (1863).*C. longirostris* var. *microcystis* BOECKL. Linn. XLI, 241 (1875).

Wats. and Coult., Gray's Man. 6 ed. 603; Mac., Fl. Can. II, 162; Bail., Typ. Car. 70; Webb., Fl. Neb. 98; Coult., Fl. Colo. 380; Britt., Fl. N. J. 272; Upham, Fl. Minn. 159; Bail., Syn. Car. 102.

North America: N. Br., Q., Ont., Man. to Brit. Col. and Rocky mts.; S. to N. Eng., N. J., Penn.; W. to Neb., Minn. and Dak.

Minn. valley: Forest district; rocky soil and shaded places.

HERB.: *Sheldon 117*, Madison lake; *Ballard 126*, Chaska; *Sheldon 1632*, Taylor's Falls; *Kassube 271*, Minneapolis; *Sandberg 553*, Center City.**Carex limosa** LINN. Spec. 977 (1753).*C. elegans* WILLD. Prodr. 34 (1787).*C. laxa* DEW. Sill. Journ. XXVI, 376 (1834).*C. limosa* var. *prairei* DEW. Sill. Journ. XXIX, 71 (1837).*C. irriqua* Torr. Club Cat. N. J. (1885).

Wats. and Coult., Gray's Man. 6 ed. 602; Mac., Fl. Can. II, 150; Britt., Fl. N. J. 272; Upham, Fl. Minn. 156; Richt., Pl. Eur. 161; Herd, Fl. Eur. Russ. 142; Trautv., Fl. Sib. 130; Led., Fl. Ross. IV, 307; Hook., Fl. Gt. Brit. 456; Engl. Pax, Nat. Pflanz. II, 2, 125; Bail., Syn. Car. 94; Hart., Scand. Fl. I, 456; Rothr., Fl. Alask. 457.

N. and mid. Europe; N. and W. Asia.

North America: N. S., N. Br., Q., Ont. to Man., Brit. Col., N. W. T. and Sitka, Alaska; S. to N. Eng., N. J. and Penn.; W. to Ill. and Minn.

Minn. valley: Forest district; infrequent; peat bogs and shaded marshes.

HERB.: *Bailey* 294, St. Louis river; *Sandberg* 541, Red Wing.

Carex magellanica LAM. Enc. Meth. III, 385 (1789).

C. limosa var. *irrigua* WAHL. K. Acad. Handl. XXIX, 162 (1803).

C. paupercula MICHX. Fl. N. A. I, 172 (1803).

C. lenticularis DEW. Sill. Journ. VII, 273 (1823).

C. irrigua Sm. Hoppe Car. 72 (1828).

Wats. and Coult., Gray's Man. 6 ed. 602; Mac., Fl. Can. II, 150; Upham, Fl. Minn. 156; Bail., Typ. Car. 70; Coult., Fl. Colo. 387; Richt., Pl. Eur. 161; Herd., Fl. Eur. Russ. 142. Hook., Fl. Gt. Brit. 456; Wats., King Exp. 361; Engl. Pax, Nat. Pflanz. II, 2, 125; Bail., Syn. Car. 94; Hart., Fl. Scand. I, 457.

Northern Europe to Pyrenees and Caucasus; S. America.

North America: Newf., N. S., N. Br., Q., N. E. T., Man., Vancouver; S. to Penn., Minn. and Utah.

Minn. valley: Forest district; rare; peat bogs and low marshes in woodland.

HERB.: *Bailey* 90, Vermilion lake.

Carex crinita LAM. Enc. Meth. 393 (1789).

C. gynandra SCHWEIN. An. Tab. (1823).

C. crinita var. *gynandra* S. and TORR. Car. Mon. 360 (1924).

C. mitchelliana CURT. Sill. Journ. XLIV, 84 (1836).

C. crinita var. *paleacea* DEW. Sill. Journ. X, 270 (1826).

C. crinita var. *minor* BOOTT, Ill. 18 (1862).

Wats. and Coult., Gray's Man. 6 ed. 661; Britt., Fl. N. J. 272; Mac., Fl. Can. II, 149; Upham, Fl. Minn. 156; Chap., Fl. S. St. 536. Chap., Suppl. S. St. 660; Cov., Fl. Ark. 231.

North America: Newf., N. Br., Q., Ont. to Ott.; S. to N. Eng., N. J., and Va. to Fla.; W. to Minn. and Ark.

Minn valley: Forest district and probably westward; wet ground along streams and around lakes.

HERB.: *Bailey* 107, Vermilion lake.

Carex prasina WAHL. K. Acad. Handl. XXIV, 161 (1802).

C. miliacea MUHL. Willd. Spec. V (1806).

Wats. and Coult., Gray's Man. 6 ed. 601; Mac., Fl. Can. II, 139; Bail., Typ. Car. 61; Britt., Fl. N. J. 272; Chap., Fl. S. St. 538; Upham, Fl. Minn. 157; Bail., Syn. Car. 87.

North America: Ont. and Vt. to N. J. and mts. of Ga; W. to Mich., Wisc. and Minn.

Minn. valley: Forest district; wet meadows and along streams.

HERB.: *Kassube* 268, Ramsey Co.

Carex aquatilis WAHL. K. Acad. Handl. XXIV, 165 (1802).

Vigne a aquatilis REICH. Fl. Exc. 140 (1830.)

Wats. and Coult., Gray's Man. 6 ed. 600; Mac., Fl. Can. II, 143; Upham, Fl. Minn. 155; Coult., Fl. Colo. 388; Britt., Fl. N. J. 271; Herd., Fl. Eur. Russ. 142; Richt., Pl. Eur. 155; Hook., Fl. Gt. Brit. 455; Wats., King Exp. 368; Roth., Wheel. Exp. 277; Bail., Syn. Car. 84; Hart, Fl. Scand. I, 466; Rothr., Alask. 457.

Arctic and Northern Europe.

North America: Greenland, N. S., N. Br., Ont. to Hudson Bay, Man., Brit. Col. and Vancouver; Alaska; S. to N. Eng. and Minn. and N. J.

Minn. valley: Forest district to New Ulm; infrequent or local; margins of ponds and rivers.

HERB.: *Bailey* 145, Vermilion lake; *Sandberg* 540, Minnesota.

Carex stricta LAM. Enc. Meth. III, 387 (1789).

C. acuta PURSH, Fl. Am. I, 38 (1814).

C. angustata BOOTT, Hook., Fl. Bor.-Am. II, 218 (1840).

C. strictior DEW. Wood, Bot. 755 (1861).

C. virginiana var. *elongata* BOECK. Linn. XL, 432 (1875).

C. vulgaris BAIL. Upham, Fl. Minn. 155 (1884).

Wats. and Coult., Gray's Man. 6 ed. 599; Mac., Fl. Can. II, 144; Webb., Fl. Neb. 98?; Bail., Typ. Car. 70, 71, 72; Chap., Fl. S. St. 535; Britt., Fl. N. J. 271; Engl. Pax, Nat. Pflanz. II, 2, 124; Bail., Syn. Car. 84.

North America: Newf., N. S., N. Br., Q. Ont., to Man.; S. to N. Eng., N. J. and Va.; W. to Minn. and Neb.?

Minn. valley: Forest district; Ft. Snelling; to Blue Earth Co.; moist banks of streams and lakes.

HERB.: *Ballard* 8a, Zumbrota; *Ballard* 3a, Goodhue Co.; *Kassube* 263, Minneapolis; *Roberts* 261, Agate Bay.

Carex fusca ALL. Ped. Fl. 2324 (1785).

C. buxbaumii WAHL. K. Acad. Handl. XXIV, 163 (1802).

C. canescens HOOK. Fl. Bor.-Am. II, 216 (1840).

Wats. and Coult., Gray's Man. 6 ed. 599; Upham, Fl. Minn. 156; Britt., Fl. N. J. 271; Bail., Typ. Car. 60; Mac., Fl. Can. II, 134; Chap., Fl. S. St. 537; Wats., Fl. Calif. II, 238; Bail., Syn. Car. 77; Coult., Fl. Colo. 387; Richt., Pl. Eur. 168; Hook., Fl. Gt. Brit. 453; Wats., King Exp. 371; Roth., Wheel. Exp. 278; Engl. Pax, Nat. Pflanz. II, 2, 125; Hart., Fl. Scand. I, 463; Rothr., Alask. 457.

Arctic and Alpine Europe; N. Asia; Alpine Australia.

North America: Newf., Hudson Bay and Sitka, Alaska; S. to Arizona and New Mex. in Rocky mts.; S. to N. Eng., N. J., Penn. and mts. of Ga.; W. to Minn., Ill. and Dak.

Minn. valley: S. central district; peat bogs and shaded marshes in forest.

Carex riparia CURT. Fl. Lond. IV, 60 (1821).

C. acuta ALL. Ped. Fl. 2347 (1785).

C. crassa EHRH. Beitr. IV, 43 (1789).

C. lacustris WILLD. Spec. IV (1805).

C. exaltata PETRM. Flora 340 (1844).

Wats. and Coult., Gray's Man. 6 ed. 598; Mac., Fl. Can. II. 164; Upham, Fl. Minn. 158; Britt., Fl. N. J. 271; Chap., Fl. S. St. 545; Richt., Pl. Eur. 167; Herd., Fl. Eur. Russ. 142; Hook., Fl. Gt. Brit. 465; Engl. Pax, Nat. Pflanz. II, 2, 125; Bail., Syn. Car. 76; Hart., Fl. Scand. I, 451.

Northern, Central and Southern Europe; W. Asia; N. Africa and S. America.

North America: Newf., N. Br., Q., Ont. to Man.; S. to N. Eng., N. J., Ga. and Fla.; W. to Minn. and Mo.

Minn. valley: Forest district to Blue Earth Co.; margins of ponds, streams and swamps.

HERB.: Sandberg 549, Chisago Co.

Carex trichocarpa MUHL. Willd. Spec. IV, 302 (1805).

C. trichocarpa var. *turbinata* DEW. Sill. Journ. XI, 159 (1827).

C. striata CAREY, Gray's Man. ed. I, 561 (1848).

Wats. and Coult., Gray's Man. 6 ed. 598; Mac., Fl. Can. II, 174; Wats., Fl., Calif. II, 251 (*in var.*); Upham, Suppl. Minn. 86; Britt., Fl. N. J. 271; Webb., Fl. Neb. 98 (*in var.*).

North America: Ont. and N. Eng. to N. J. and Penn.; W. to Minn. and Mo.

Minn. valley: Probably throughout; marshes and wet meadows.

HERB.: Sheldon 1302, Lake Benton; Sandberg, 617, Center City.

Carex trichocarpa MUHL. var. **aristata** (R. BR.) BAIL. Bot. Gazette, X, 293 (1885).

C. aristata R. BR. Appx. Frankl. Narr. (1823).

C. atherodes SPRENG. Syst. Veg. III, 828 (1826).

C. orthostachys C. MEY. Fl. Alt. IV, 231 (1844).

C. aristata var. *longo-lanceata* DEW. Sill. Journ. XVIII, 102 (1854).

Wats. and Coult., Gray's Man. 6 ed. 598; Mac., Fl. Can. II, 175; Upham, Fl. Minn. 158; Bail., Typ. Car. 70; Bail. Syn. Car. 75. Coult., Fl. Colo., 381; Wats., King Ex. 374; Roth., Wheel. Exp. 278, 281; Webb., Appx. Neb. 24.

North America: Ont., Man. and Saskatchewan, Athabasca, Peace river region, Columbia valley and Rocky mts.; S. to N. Eng., Wisc., Minn., Neb. and Utah.

Minn. valley: Throughout; typical form westward; variety eastward; wet places or edges of streams and ponds.

HERB.: *Sheldon* 1302, Lake Benton (*typical*); *Sheldon* 402, Madison Lake, Blue Earth Co.; *Ballard* 46, Chaska; *Ballard* 44, Chaska [*var aristata* (R. Br.)]; *Ballard* 6a, Goodhue Co.; *Sandberg* 550, Chisago Co.

Carex filiformis LINN. Spec. 976 (1753).

C. tomentosa LIGHTF. Fl. Scot. II, 552 (1777).

C. splendida WILLD. Prodr. 103 (1787).

C. lasiocarpa GAUD. Agr. II, 125 (1811).

Wats. and Coult., Gray's Man. 6 ed. 597; Britt., Fl. N. J. 271; Mac., Fl. Can. II, 165; Webb., Fl. Neb. 98; Wats., Fl. Calif. II, 250 *in var.*; Coult., Fl. Colo. 381; Upham, Fl. Minn. 158; Richt., Pl. Eur. 167; Herd., Fl. Eur. Russ. 142; Hook., Fl. Gt. Brit. 460; Wats., King Exp. 374; Bail., Syn. Car. 74; Engl. Pax, Nat Pflanz. II, 2, 125; Hart., Fl. Scand. I, 454.

Middle Europe and Siberia.

North America: Newf., N. S., N. Br., Ont., Man., Brit. Col. and Vancouver; S. to N. Eng., N. J., Penn.; W. to Ind., Minn., Neb., Dak. and Mont.

Minn. valley: Forest district and extending westward to Granite Falls; peat bogs and swamps.

HERB.: *Bailey* 200, Vermilion lake; *Sandberg* 548, Chisago Co.

Carex filiformis LINN. *var. lanuginosa* (MICHX.) B. S. P. Cat. N. Y. (1888).

C. lanuginosa MICHX. Fl. N. Am. I, 175 (1803).

C. pellita MUHL. Willd. Spec. IV (1805).

C. filiformis *var. latifolia* BOECKL. Linn. XLI, 309 (1875).

Wats. and Coult., Gray's Man. 6 ed. 597; Mac., Fl. Can. II, 165; Bail., Syn. Car. 74; Bail., Typ. Car 64; Coult., Fl. Colo. 381; Wats., Fl. Calif. II, 250; Britt., Fl. N. J. 271; Upham, Fl. Minn. 158; Roth., Wheel. Exp. 278; Wats., King Exp. 373; Webb., Appx. Neb. 23.

North America: N. S., N. Br., Q., Ont. to Saskatchewan, Athabasca and Mackenzie river region; Brit. Col. and Vancouver; S. to N. J. and Va.; W. to Minn., Mo., Colo., Tex. Mex. and Calif.

Minn. valley: Forest district; N. W. districts; swamps and marshes.

HERB.: *Sheldon* 250, Lake Washington, Le Sueur Co.; *Ballard* 34, Carver; *Ballard* 19a, Goodhue Co.; *Kassube* 269, Ramsey Co.

Carex houghtonii TORR. Cyp. 413 (1836).

Wats. and Coult., Gray's Man. 6 ed. 597; Mac., Fl. Can. II, 164; Upham, Fl. Minn. 158; Bail., Syn. Car. 74.

North America: N. S., Q., Hudson Bay to Saskatchewan and N. W. T., lat. 54° N.; S. to Maine and N. Y.; W. to Wisc., Minn. and Iowa.

Minn. valley: Forest district to Blue Earth Co.; wet banks and shores.

HERB.: *Bailey 206*, Vermilion lake; *Bailey 509*, Agate Bay.

Carex squarrosa LINN. Spec. 973 (1753).

C. typhina MICHX. Fl. N. Am. I, 169 (1803).

C. typhinoidea SCHWEIN. An. Tab. (1823).

Wats. and Coult., Gray's Man. 6 ed. 596; Mac., Fl. Can. II, 137; Britt., Fl. N. J. 270; Upham, Fl. Minn. 158; Chap., Fl. S. St. 537; Cov., Fl. Ark. 231; Bail., Syn. Car. 71; Webb., Appx. Neb. 23.

North America: Ont. to N. Eng., N. J. and Ga.; W. to Minn., Mo. and Neb.

Minn. valley: Reported from the S. E. edge; rare; low, wet meadows or swamps.

Carex pseudocyperus LINN. Spec. 978 (1753).

C. reversa GILIB. Exerc. Phyt. II, 549 (1792).

Wats. and Coult., Gray's Man. 6 ed. 596; Mac., Fl. Can. II, 174; Upham, Fl. Minn. 158; Britt., Fl. N. J. 270; Richt., Pl. Eur. 166; Herd., Fl. Eur. Russ. 142; Hook., Fl. Gt. Brit. 465; Engl. Pax, Nat. Pflanz. II, 2, 125; Bail., Syn. Car. 76; Hart., Fl. Scand. I, 455.

Northern, Central and Southern Europe; Asia; temperate and S. Africa; Australia.

North America: N. S., N. Br., Q., Ont. to Man. and Saskatchewan; S. to N. Eng., N. J., Penn., Mich., Wisc. and Minn.

Minn. valley: Reported from forest district and S. W. district; rare; margins of lakes and bogs.

Carex pseudocyperus LINN. var. **americana** HOCHST. Herb. Un. It. (1837).

C. furcata ELL. Sk. II, 552 (1824) *not* Lap.

C. pseudocyperus SCHWEIN. and TORR. Car. Mon. 355 (1825).

C. comosa BOOTT, Linn. Trans. XX, 117 (1845).

C. pseudocyperus var. *comosa* BOOTT, Bot. Calif. II, 252 (1880).

Wats. and Coult., Gray's Man. 6 ed. 596; Mac., Fl. Can. II, 174; Britt., Fl. N. J. 270; Bail., Typ. Car. 54; Chap., Fl. S. St. 543; Upham, Fl. Minn. 158; Mac., Fl. Can. II, 389; Bail., Syn. Car. 70.

North America: Newf., N. Br., Ont.; S. to N. Eng., N. J., Ga.; W. to Minn., Mo. and La.; also, Oregon and Calif.

Minn. valley: Forest district; abundant; edges of ponds and in bogs.

HERB.: *Ballard 781*, Swan lake, Carver Co.; *Ballard 172*, Shakopée; *Sheldon 992*, Cross lake, Brown Co.; *Sheldon 341*, Smith's Mill, Blue Earth Co.; *Sheldon 248*, Lake Washington, Le Sueur Co.; *Taylor 407*, Lake Elysian; *Ballard 1a*, Zumbrota.

Carex hystericina MUHL. Willd. Spec. IV (1805).*C. cooleyi* DEW. Sill. Journ. XLVIII, 144 (1845).*C. georgiana* DEW. l. c. VI, 245 (1848).*C. thurberi* DEW. Mex. Bound. 232 (1859).

Wats. and Coult., Gray's Man. 6 ed. 596; Mac., Fl. Can. II, 173; Chap., Fl. S. St. 543; Webb., Fl. Neb. 98; Britt., Fl. N. J. 270; Coult., Fl. Colo. 382; Bail., Syn. Car. 69.

North America: Newf., N. S., N. Br. to Man., Saskatchewan and N. of lat. 52° in prairie region; S. to N. Eng., N. J., Ga.; W. to Minn., Dak., Neb., Ind. Terr. and N. Mex.

Minn. valley: Forest district and westward to Chipewa valley at least; wet meadows and margins of lakes.

HERB.: *Sheldon* 342, Smith's Mill, Blue Earth Co.; *Ballard* 7, Chaska; *Ballard* 338, Jordan, Scott Co.; *Taylor* 75, Elysian; *MacM.* and *Sheld.* 62, Brainerd; *Ballard* 4a, Zumbrota; *Herrick* 336, Minneapolis; *Kassube* 270, Minneapolis; *Sandberg* 551, Center City; *Wickersheim* 135, Ash lake, Lincoln Co.

Carex schweinitzii DEWEY, Sill. Journ. IX, 68 (1825).

Wats. and Coult. Gray's Man. 6 ed. 595; Mac., Fl. Can. II, 173; Britt., Fl. N. J. 270.

North America: W. N. Eng. and Ont. to Minn. and Mich.

Minn. valley: Forest district; swamps and borders of lakes.

HERB.: *Ballard* 33, Chaska.

Carex lurida WAHL. K. Acad. Handl. XXIV, 153 (1803).*C. tentaculata* MUHL. Willd. Spec. IV, 266 (1805).*C. rostrata* WILLD. Spec. IV, 282 (1805).*C. gigantea* KUNTH, Enum. II, 503 (1837).*C. purshii* OLN. Exsicc. I, 30 (1871).*C. beyrichiana* BOECKL. Linn. XLI, 239 (1876).

Wats. and Coult., Gray's Man. 6 ed. 595; Bail., Typ. Car. 10; Mac., Fl. Can. II, 173; Coult., Fl. Colo. 382; Britt., Fl. N. J. 270; Upham, Fl. Minn. 158; Mac., Fl. Can. II, 389; Cov., Fl. Ark. 231.

North America: N. S., N. Br., Q., Ont. to N. Eng., N. J., Va. and Fla.; W. to Minn., Ill., Mo. and Ark.

Minn. valley: Reported from forest district; infrequent; wet meadows and bogs.

Carex retrorsa SCHWEIN. An. Tab. (1823).*C. reversa* SPRENG. Syst. Veg. III, 827 (1826).

Wats. and Coult., Gray's Man. 6 ed. 595; Bail., Typ. Car. 71; Bail., Syn. Car. 68; Upham, Fl. Minn. 158.

North America: N. S., N. Br., Q., Ont. to Man., Saskatchewan, Brit. Col. and Rocky mts.; S. to N. Eng., Penn., Mich. and Minn.

Minn. valley: Throughout; margins of lakes and streams; not infrequent.

HERB.: *Taylor* 905, Glenwood; *Bailey* 67, Vermilion lake; *Bailey* 101, Vermilion lake; *Juni* 22, Moose lake; *Ballard* 13a, Goodhue Co.; *Herrick* 337, Minneapolis; *Taylor* 1128, Glenwood.

Carex tuckermanni DEW. Sill. Journ. XLIV, 48 (1845).

C. bullata AUCT. AMER., not SCHKUHR.

C. cylindrica GRAY, Man. ed. I, 566 (1848).

Wats. and Coult., Gray's Man. 6 ed. 594; Mac., Fl. Can. II, 172, Upham, Suppl. Minn. 86; Britt., Fl. N. J. 269.

North America: Newf., N. Br., Q., Ont. and W. N. Eng. to N. J. and Minn.

Minn. valley: Forest district; swamps and borders of lakes.

HERB.: *Sheldon* 149, Madison Lake; *MacM.* and *Sheld.* 64, Brainerd; *Sandberg* 612, 613, Center City; *Bailey* 104, Vermilion lake.

Carex monile TUCKERM. Enum. Meth. 20 (1843).

C. vaseyi DEW. Sill. Journ. XXIX, 347 (1860).

Wats. and Coult., Gray's Man. 6 ed. 594; Britt., Fl. N. J. 269; Bail., Typ. Car. 39; Wats., Fl. Calif. II, 251; Coult., Fl. Colo. 353; Upham, Fl. Minn. 158; Bail., Syn. Car. 67.

North America: N. S., N. Br., Q., Ont., N. E. T.; also Brit. Col. and Calif.; S. to N. Eng., N. J. and Fla.; W. to Minn. and Mo.

Minn. valley: Forest district; wet places and edges of ponds or streams.

HERB.: *Taylor* 25, Elysian; *Ballard* 9a, Goodhue, Co.; 10a, Goodhue Co.; *Juni* 23, Agate bay; *Bailey* 423, Fall lake; *Bailey* 274, St. Louis river.

Carex utriculata BOOTT, Hook. Fl. Bor.-Am. II, 221 (1840).

C. ampullacea var. *utriculata* CAREY, Gray's Man. ed. 1, 566 (1848).

C. rostrata var. *utriculata* BAIL. Proc. Am. Acad. XXII, 67 (1886).

Wats. and Coult., Gray's Man. 6 ed. 594; Mac., Fl. Can. II, 171; Britt., Fl. N. J. 269; Wats., Fl. Calif. II, 252; Upham, Fl. Minn. 158; Coult., Fl. Colo. 383; Mac., Fl. Can. II, 388; Wats., King Exp. 374; Roth., Wheel. Exp. 278; Bail., Syn. Car. 67.

North America: Atl. to Pac. in Can.; S. to N. Eng., N. J. and Fla.; W. to Minn. and Mo.; S. in Rocky mts. to Colo. and Utah.

Minn. valley: Forest district and N. W.; swamps and marshes.

HERB.: *Ballard* 43, Chaska; *Taylor* 520, Mud lake,

Waseca Co.; *Bailey 144*, Vermilion lake; *Bailey 112*, Vermilion lake.

Carex oligosperma MICHX. Fl. Am. II, 174 (1803).

C. oakesiana DEW. Sill. Journ. XIV, 351 (1828).

Wats. and Coult., Gray's Man. 6 ed. 593; Mac., Fl. Can. II, 168; Upham, Fl. Minn. 159.

North America: N. Eng., N. Br. to Bear lake and lat. 66° N.; S. to Penn. and Minn.

Minn. valley: N. E. district; swamps and borders of lakes.

HERB.: *Sandberg 615, 616*, Center City; *Arthur 10a*, White Bear lake.

Carex lupulina MUHL. Willd. Spec. IV (1805).

C. lurida BAIL. Proc. Am. Acad. XXII, 63 (1886).

Wats. and Coult., Gray's Man. 6 ed. 593; Bail., Typ. Car. 11; Mac., Fl. Can. 167; Britt., Fl. N. J. 269; Coult., Fl. Colo. 382; Chap., Fl. S. St. 543; Upham, Fl. Minn. 158; Mac., Fl. Can. II, 386; Engl. Pax, Nat. Pflanz. II, 2, 125; Bail., Syn. Car. 63.

North America: N. S., Q., Ont. to Hudson Bay; S. to N. Eng., N. J. and Fla.; W. to Minn., Ind. Terr. and N. Mex.

Minn. valley: Forest district; Ft. Snelling to Blue Earth Co.; wet meadows, bogs and swamps.

HERB.: *Sheldon 334*, Smith's Mill, Blue Earth Co.; *Ballard 697*, Waconia; *Sandberg 552*, Red Wing.

Carex lupulina MUHL. var. *longipedunculata* SARTW. Herb. (1856).

C. folliculata LAM. Enc. Meth. III, 391 (1789).

C. gigantea RUDGE, Linn. Trans. VII, 99 (1804).

C. lupulina MUHL. var. *pedunculata* DEW. Wood, Cl.-Bk. Bot. 376 (1855).

C. canadensis DEW. Sill. Journ. XLI, 229 (1866).

C. lupulina UPH. Fl. Minn. 158 (1884) in part.

C. lurida var. *polystachya* BAIL. Proc. Am. Acad. XXII, 63 (1886) in part.

C. lurida MACOUN, Fl. Can. II, 167 (1888) in part.

Wats. and Coult., Gray's Man. 6 ed. 593; Bail., Typ. Car. 12; Chap., Fl. S. St. 543(?); Britt., Fl. N. J. 269(?); Mac., Fl. Can. II, 386; Bail., Syn. Car. 64.

North America: Ont. to Hudson Bay?; S. to N. Eng., N. J., Fla.; W. to Minn., Iowa and Mo.

Minn. valley: Forest district, especially N. E.; infrequent; wet meadows and bogs.

Carex intumescens RUDGE, Linn. Trans. VII, 97 (1804).

C. folliculata WAHL. K. Acad. Handl. XXIV, 152 (1802) not Linn.

Wats. and Coult., Gray's Man. 6 ed. 592; Mac., Fl. Can. II, 167; Upham, Fl. Minn. 158; Britt., Fl. N. J. 269; Bail., Typ. Car. 62, 64, 72; Chap., Fl.

S. St. 554; Coult., Fl. Colo. 382; Engl. Pax, Nat. Pflanz. II, 2, 125; Bail., Syn. Car. 62

North America: Newf., N. S., N. Br., Q., Ont. to Man.; S. to N. Eng., N. J. and Fla.; W. to Minn. and Mo.

Minn. valley: Forest district; S. W. district; probably throughout; wet meadows and bogs or swamps.

HERB.: *Taylor* 50, Elysian; *Bailey* 68, Vermilion lake; *MacM.* and *Sheld.* 61, Brainerd.

Carex pauciflora LIGHTF. Fl. Scot. II, 543 (1777).

C. patula HUDS. Fl. Angl. 402 (1762) not Host.

C. leucoglochis LINN. f. Suppl. 413 (1781).

Leucoglochis pauciflorus HEUFF. Flora 528 (1844).

Psyllophora pauciflora SCHUR. Enum. 697 (1866).

Wats. and Coult., Gray's Man. 6 ed. 592; Mac., Fl. Can. II, 111; Richt., Pl. Eur. 145; Hook., Fl. Gt. Brit. 448; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 138; Upham, Suppl. Minn. 86; Rothr., Alask. 457.

Arctic and Alpine Europe.

North America: Newf. to Ont., Man., N. W. T. and Vancouver; N. to Sitka; S. to N. Eng., N. Penn., Mich. and Minn.

Minn. valley: N. districts; peat bogs and cold marshes.

HERB.: *Sandberg* 614, Center City; *Bailey* 203, Vermilion lake.

X. AROIDEAE. Arum Family.

Orontiaceae LINDL. Veg. King. 193 (1846).

Araceae ENGLER, DC. Mon. Phan. II (1875).

Endlicher, *Gen. Pl.* 232 (1840); Benth. and Hook., *Gen. Pl.* III, 955 (1883); Engler in *Engler and Prantl, Nat. Pflanz.* 2, III, 102 (1887).

Genera: 105 living; 2-3 extinct? Tropical and temperate regions.

Species: 1000; 92 per cent. in tropics; 8 per cent. in temperate regions.

ACORUS LINN. Gen. 296 (1737).

Benth. and Hook., *Gen. Pl.* III, 999; Durand, *Ind. Gen. Phan.* Engler and Prantl., *Nat. Pflanz.* 2, III, 118 (Engler); Schenck, *Palaeophyt.* 378.

Living species: 2; Japan, 1; temperate northern regions; 1.

Fossil species: 2-3, doubtful; Spitzbergen, 1: tertiary, (*Heer*).

Acorus calamus LINN. Spec. 324 (1753).

A. odoratus LAM. Fl. Fr. III, 299 (1778).

Calamus aromaticus GULDENST. It. II, 327 (1791).

Acorus aromaticus GILIB. Exerc. Phyt. II, 205 (1792).

A. commutatus SCHOTT. Prodr. Aroid. 578 (1860).

Wats. and Coult., Gray's Man. 6 ed. 551; Britt., Fl. N. J. 254; Upham, Fl. Minn. 135; Mac., Fl. Can. II, 74; Chap., Fl. S. St. 442; Webb., Fl. Neb., 98; Hook., Fl. Gt. Brit. 424; Trautv., Fl. Sib. 112; Led., Fl. Ross. IV, 13; Richt., Pl. Eur. 171; Herd., Fl. Eur. Russ. 122; Engl., Nat. Pflanz. II, 3, 118; Cov., Fl. Ark. 227; Hart., Scand. Fl. I. 429.

Almost all Europe; temperate Asia to China and Japan.

North America: N. S., N. Br., Q., Ont., Owen Sound; L. of Woods and Saskatchewan; S. to N. J. and Fla.; W. to Minn., Dak., Iowa, Neb., Kan. and Ark.

Minn. valley: E. districts to Chippewa valley; margin of swamps and streams.

HERB.: *Ballard 23n*, Chaska; *Taylor 10*, Elysian; *Leiberg 62*, Blue Earth Co.; *Bailey 50*, Vermilion lake; *Sandberg 524*, Red Wing; *Sandberg 525*, Chisago Co.; *Sandberg 526*, Chisago Co.; last two are narrow-leaved *forma angustifolia*.

SPATHYEMA RAF. Med. Rep. X, 173 (1808).

Ictodes BIGEL. Med. Bot. I, 43 (1817).

Symplocarpus SALISB. Nutt. Gen. I, 105 (1818).

Benth. and Hook., *Gen. Pl.* III, 995; Durand, *Ind. Gen. Phan.* 446; O. Kuntze, *Rev. Gen.* II, 743; Engler and Prantl, *Nat. Pflanz.* 2, III, 122 (Engler).

Living species: 1; Atl. N. America, Japan and Amurland.

Spathyema foetida (LINN.) RAF. Med. Rep. II, 10, 173 (1808).

Dracontium foetidum LINN. Spec. 967 (1762).

Pothos foetidus MICHX. Fl. N. Am. II, 186 (1803).

Ictodes foetidus BIGEL. Med. Bot. II, 41 (1817).

Symplocarpus foetidus SALISB. Nutt. Gen. 1, 105 (1818).

Wats. and Coult., Gray's Man. 6 ed. 551; Britt., Fl. N. J. 254; Mac., Fl. Can. II, 73; Upham, Fl. Minn. 134; Chap., Fl. S. St. 441; Engl., Nat. Pflanz. II, 3, 122.

Japan and Amurland.

North America: N. S.; N. B., Q., Ont. to swamps of N. Car.; W. to Minn. and Iowa.

Minn. valley: Forest district to New Ulm; local; bogs and near springs.

HERB.: *Holzinger 262*, Winona Co.; *Herb. Sheld.* 1863, Minneapolis.

CALLA LINN. Gen. 697 (1737).

Provenzalia ADANS. Fam. II, 469 (1763).

Benth. and Hook., *Gen. Pl.* III, 989; Durand, *Ind. Gen. Phan.* 446; Engler and Prantl, *Nat. Pflanz.* 2, III, 123 (Engler).

Living species: 1; Europe to Alps and Carpathians; Siberia; Atl. N. Amer.

Calla palustris LINN. Spec. ed. 2, 1373 (1762).*C. aethiopica* GAERTN Fruct. II, 20 (1791).

Wats. and Coult., Gray's Man. 6 ed. 550; Britt., Fl. N. J. 253; Mac., Fl. Can. II, 73; Upham, Fl. Minn. 134; Nym., Fl. Eur.; Led., Fl. Ross. IV, 11; Richt., Pl. Eur. 171; Herd., Fl. Eur. Russ. 122; Engl., Nat. Pflanz. II, 3, 123; Hart., Fl. Scand. I, 428.

Europe, N. of Alps and Carpathians; Siberia.

North America: N. S., N. Br., Q., Ont., Man. to Saskatchewan and Hudson Bay, N. W. T.; S. to N. Eng., N. J., Mich. and Minn.

Minn. valley; N. E. district only; cold marshes and bogs; perhaps N. W.

HERB.: *Bailey* 98, Vermilion lake; *Roberts* 123, Duluth; *Sheldon* 2000a, Keegan's lake; *MacM.* 107a, Taylor's Falls.

ARISAEMA MART. Flora, II, 459 (1831).

Benth. and Hook., *Gen. Pl.* III, 965; Durand, *Ind. Gen. Phan.* 430; Engler and Prantl, *Nat. Pflanz.* 2, III, 150 (Engler).

Living species: $50 \pm$; mostly temperate and subtropical Asia; 1-2, Abyssinia; N. America, 3-4; Canada, 2; E. sts., 2; S. sts., 3; only in Atl. Region

Fossil species: *Araceae* (see *Schenck, Palaeophyt*, 377).

Arisaema triphyllum (LINN.) TORR. Fl. N. Y. II (1843).*Arum triphyllum* LINN. Spec. 1365 (1758) *pro parte*.*Arisaema atrorubens* BLUME, Rumphia I, 97 (1835).

Wats. and Coult., Gray's Man. 6 ed. 549; Britt., Fl. N. J. 252; Chap., Fl. S. St. 440; Upham, Fl. Minn. 134; Mac., Fl. Can. II, 72; Webb., Fl. Neb. 97; Cov., Fl. Ark. 227.

North America: N. S., N. Br., Q., Ont., N. Superior region to Man.; S. to N. Eng., N. J., Fla.; W. to Minn., Neb., E. Kansas and Ark.

Minn. valley: Throughout; abundant; rich woodland and shaded river-banks.

HERB.: *Taylor* 432a, Janesville; *Ballard* 58, Chaska; *Arthur* 156, Vermilion lake; *Herrick* 278, Minneapolis; *Kasube* 221, Minneapolis; *Sandberg* 523, Vasa; *Herb. Wickersheim* 116, Lake Benton; *Herb. Moyer* 227, 228, Montevideo.

XI. LEMNACEAE. Duck-Weed Family.**Pistiaceae** LINDL. Veg. Kingd. (1846) *in part*.

Endlicher, *Gen. Pl.* 232 (1840); Benth. and Hook., *Gen. Pl.* III, 1000 (1883); Engler in *Engler and Prantl, Nat. Pflanz.* 2, III, 154 (1887).

Genera: 2; temperate and tropical regions.

Species: $24 \pm$; over one-half in tropics.

LEMNA LINN. Gen. 798 (1737).**Telmatophace** SCHLEID. Linn. XIII, 391 (1839).**Spirodela** SCHLEID. l. c. (1839).

Benth. and Hook., *Gen. Pl.* III. 1001; Durand, *Ind. Gen. Phan.* 451; Engler and Prantl, *Nat. Pflanz.* 2, III. 163, 164 (Engler); Schenck, *Palaeophyt.* 378.

Living species: 7; temperate and tropical regions. Russia, 3; Europe, 4; N. America, 6; Canada, 3; Rocky mts., 3; S. Sts., 3; California, 5-6; Pl. King, 4; E. Sts., 6.

Fossil species: 2; Oligocene, Spitzbergen (*Heer*); Samland (*Conwentz*).

Lemna minor LINN. Spec. 970 (1753).*Lenticula minor* SCOP. Fl. Carn. 1142 (1772).*Lemna vulgaris* var. *B.* LAM. Enc. Meth. III, 464 (1789).*Lemna minima* HUMB. Gen. I, 372 (1815).*L. cyclostasa* ELL. ex. Schleid. Linn. XIII, 390 (1839).

Wats. and Coult., Gray's Man. 6 ed. 553; Britt., Fl. N. J. 254; Webb., Fl. Neb. 97; Wats., Fl. Calif. II, 190; Upham, Fl. Minn. 135; Mac., Fl. Can. II. 75; Coult., Fl. Colo. 360; Chap., Fl. S. St. 442; Nym., Fl. Eur.; Led., Fl. Ross. IV, 17; Gris., Fl. W. I.; Hook., Fl. Gt. Brit. 425; Richt., Pl. Eur. 175; Herd., Fl. Eur. Russ. 122; Engl., Nat. Pflanz. II. 3, 164; Wats., King Exp. 336; Cov., Fl. Ark. 228; Hart., Fl. Scand. I, 430.

Europe; Asia; Africa; Australia; S. America.

North America: Throughout; continent below 58° N. lat.

Minn. valley: Forest district and probably westward; ponds and pools; floating on the surface.

HERB.: *Ballard* 610, Chaska; *Ballard* 9, Chaska.

Lemna perpusilla TORR. N. Y. Fl. II, 245 (1843).

Wats. and Coult., Gray's Man. 6 ed. 552; Britt., Fl. N. J. 254.

North America: N. Y. and N. J. to Mich., Wis. and Minn.

Minn valley: Forest district; floating in ponds and pools.

HERB.: *Sheldon* 118, Elysian.

Lemna trisulca LINN. Spec. 970 (1753).*Lenticula trisulca* SCOP. Fl. Carn. 1143 (1772).*Lemna cruciata* ROXB. Fl. Ind. III, 566 (1832).*L. intermedia* RUTHE, ex. Schleid. Linn. XIII, 391 (1839).*Staurogeton trisulcus* SCHUR. En. 636 (1866).

Wats. and Coult., Gray's Man. 6 ed. 552; Britt., Fl. N. J. 254; Upham, Fl. Minn. 135; Coult., Fl. Colo. 360; Mac., Fl. Can. II, 74; Webb., Fl. Neb. 97; Wats., Fl. Calif. II, 189; Hook., Fl. Gt. Brit. 425; Gris., Fl. W. I.; Nym., Fl. Eur.; Led., Fl. Ross. IV, 17; Richt., Pl. Eur. 175; Herd., Fl. Eur. Russ. 122; Engl., Nat. Pflanz. II, 3, 164; Wats., King Exp. 336; Cov., Fl. Ark. 228; Hart., Fl. Scand. I, 430.

Europe; Asia; Australia; South America; Africa.

North America: Atl. to Pac, in Can.; to lat 58° N.; S. to N. J. and W. to Minn., Neb. and N. Mex., Oregon and Calif.

Minn. valley: Throughout; not infrequent; ponds and pools, floating on the surface.

HERB.: *Ballard* 61, Chaska; *Sheldon* 355, Madison Lake, Blue Earth Co.; *Ballard* 442, Prior's lake, Scott Co.; *Taylor* 218a, Lake Helena, Waseca Co.; *Ballard* 818, Page lake, Carver Co.; *Ballard* 680, Waconia.

***Lemna polyrhiza* LINN.** Spec. 970 (1753).

Lenticula polyrhiza LAM. Fl. Fr. 189 (1778).

Lemna orbicularis KIT. in Schult. Ostr. Fl. ed. 2, 64 (1814).

L. thermalis BEAUV. in Nutt Gen. I, 19 (1818).

L. major C. A. M. Ind. Cauc. 11 (1831).

L. orbiculata ROXB. Fl. Ind. III, 565 (1832).

Speirodela polyrhiza SCHLEID. Linn. XIII, 392 (1839).

Lemna bannatica KUNTH, Enum. III, 7 (1841).

Telmatophace polyrhiza GODR. Fl. Lorr. III, 18 (1844).

T. orbicularis SCHUR. Enum. 635 (1866).

Wats. and Coult., Gray's Man. 6 ed. 552; Britt., Fl. N. J. 255; Upham, Fl. Minn. 135; Mac., Fl. Can. II, 75; Webb., Fl. Neb. 97; Wats., Fl. Calif. II. 190; Coult., Fl. Colo. 360; Chap., Fl. S. St. 443; Hook., Fl. Gt. Brit. 425; Nym., Fl. Eur.; Led., Fl. Ross IV, 18; Richt., Pl. Eur. 175; Herd., Fl. Eur. Russ. 122; Engl., Nat. Pflanz. II. 3, 164; Mac., Fl. Can. II, 368; Wats., King Exp. 336; Cov., Fl. Ark. 228; Hart., Fl. Scand. I, 429.

Europe—except Greece; Russia and Siberia; Australia; Madeiras; Central America and West Indies.

North America: Same distribution as last.

Minn. valley: Throughout; abundant; ponds and pools; floating on the surface.

HERB.: *Ballard* 441, Prior's lake, Scott Co.; *Ballard* 882, Waconia; *Ballard* 60, Chaska; *Sheldon* 724, Sleepy Eye.

GRANTIA GRIFF. Notul. III, 236 (1851) *not Boiss.*

***Wolffia* HORKEL**, ex. Schleid. Linn. XIII, 389 (1839), *not Wulffia* NECK. Elem. I, 35 (1790).

***Horkelia* REICH.** ex. Bartl. Ord. Nat. 76 (1830), *not Cham.* and Schlecht. (1827).

***Bruniera* FRANCHET**, Billotia, 25 (1864).

Benth. and Hook., Gen. Pl. III, 1001; Durand, Ind. Gen. Phan. 451; Engler and Prantl, Nat. Pflanz. 2, III, 164 (Engler).

Living species: 12; Europe; E. Indies; tropical Africa and America to Canada and Chile. N. America, 2 sp.

***Grantia brasiliensis* (WEDD).**

Wolffia brasiliensis WEDD. Ann. Sci. Nat. ser. 3, XII, 157 (1849).

Wats. and Coult., Gray's Man. 6 ed. 553; Mac., Fl. Can. II. 76.

North America: With *G. columbiana*.

Minn. valley: Forest district; probably throughout; pools and ponds; floating on the surface.

HERB.: *Ballard* 888, Lake Waconia; *Ballard* 62 (*partly*), Chaska, Carver Co.

***Grantia columbiana* (KARST).**

Wolffia columbiana KARST.

Wats. and Coult., Gray's Man. 6 ed. 553; Britt., Fl. N. J. 255; Upham, Fl. Minn. 135; Mac., Fl. Can. II, 76, 368.

North America: Ont., Conn. and N. J.; to Minn., Mo. and La.

Minn. valley: Forest district; Waconia to Blue Earth Co.; ponds and pools; floating near the surface.

HERB.: *Ballard* 62, Chaska; *Oestlund* 182, Minnehaha.

XII. XYRIDACEAE. Star-Eyed Grass Family.

Endlicher, *Gen. Pl.* 123 (1840); Benth. and Hook., *Gen. Pl.* III, 841 (1883); Engler in *Engler and Prantl, Nat. Pflanz.* 2, IV, 18 (1887).

Genera: 2; tropics and N. temperate America; largely tropical.

Species: 48±; principally in tropical America.

XYRIS LINN. Gen. 31 (1737).

Schizmaxon STEUD. Bot. Zeit. 391 (1856).

Benth. and Hook., *Gen. Pl.* III, 842; Durand, *Ind. Gen. Phan.* 433; Engler and Prantl, *Nat. Pflanz.* 2, IV, 20 (Engler); Schenck, *Palaeophyt.* 366.

Living species: 40; warmer regions, except Europe; principally N. and S. America. N. America, 20±; S. Sts., 18; E. Sts., 4; Canada, 1.

Fossil species: ?Tertiary, W. N. America (*Lesquereaux*).

***Xyris flexuosa* MUHL. Cat. 5 (1813).**

? *X. jupicai* MICHX. Fl. N. Am. I, 23 (1803) *nom. dub.*

X. bulbosa KUNTH, Enum. IV, 11 (1843).

X. scabra ENGELM. Herb. Columbia Coll.

Wats. and Coult., Gray's Man. 6 ed. 537; Britt., Fl. N. J. 247; Upham, Fl. Minn. 149; Mac., Fl. Can. II, 54; Chap., Fl. S. St. 500; Ries, Torr. Bull. XIX, 37.

North America: N. S.. Ont. (in var.?), Mass. to N. J. and Md. to Fla.; W. to Minn., Mo., Ark. and Tex.

Minn. valley: Reported from the N. E. district; rare or doubtful; sandy or peaty bogs.

XIII. ERIOCAULACEAE. Pipewort Family.

Endlicher, *Gen. Pl.* 122 (1840); Benth. and Hook., *Gen. Pl.* III, 1019 (1883); Hieronymus in *Engler and Prantl, Nat. Pflanz.* 2, IV, 21 (1887).

Genera: 6; warmer regions and in temperate zones.

Species: 340 ±; 60 per cent. in Brazil.

ERIOCAULON LINN. Gen. ed. II, 81 (1742).

Randalia, **Sphaerochloa**, **Symphachne** BEAUV. Ann. Sci. Nat. 1, xiii, 47 (1828).

Nasmythia HUDS. Fl. Angl. ed. 2, 414 (1778).

Leucocephala ROXB. Fl. Ind. III, 612 (1832).

Electrosperma F. MULL. Trans. Phil. Soc. Vict. I, 23 (1855).

Lasiolipsis BOECKL. Flora 90 (1873).

Chaetodiscus STEUD. Syn. Glum. II, 261 (1855).

Benth. and Hook., *Gen. Pl.* III, 1020; Durand, *Ind. Gen. Phan.* 454; Engler and Prantl, *Nat. Pflanz.* 2, IV, 26 (Hieronymus).

Living species: 110; Asia, Africa, Australia, S. America, E. N. America, Ireland and Hebrides. N. America, 4-5; S. Sts., 4; Canada, 1; E. Sts., 3.

Fossil species: ?Tertiary, W. N. America (*Lesquereaux*).

Eriocaulon septangulare WITH. Bot. Arr. 184 (1776).

Nasmythia articulata HUDS. Fl. Angl. 415 (1778).

Eriocaulon decangulare HULL, Brit. Fl. 29 (1799).

E. pellucidum MICHX. Fl. N. Am. II, 166 (1803).

E. articulatum MORONG, Torr. Bull. XVIII, 353 (1891).

Wats. and Coult., *Gray's Man.* 6 ed. 567; Britt., *Fl. N. J.* 260; Upham, *Fl. Minn.* 149; Mac., *Fl. Can.* II, 92; Richt., *Pl. Eur.* 176; Hook., *Fl. Gt. Brit.* 421; Engl. Hieron., *Nat. Pflanz.* II, 4, 27.

Ireland, Skye and the Hebrides.

North America: Newf., N. S., N. Br., Lake Superior and Saskatchewan; S. to N. J.; W. to Ind., Mich. and Minn.

Minn. valley: Reported from N. edge; rare; borders of ponds and lakes.

HERB.: *Bailey* 536, Burntside lake.

XIV. COMMELINACEAE. Spiderwort Family.

Endlicher, *Gen. Pl.* 124 (1840); Benth. and Hook., *Gen. Pl.* III, 844 (1883); Schönland in *Engler and Prantl, Nat. Pflanz.* 2, IV, 60 (1887).

Genera: 25; tropics, and a few in temperate regions, except of Asia and Europe.

Species: 325; 90 per cent. +, in tropics.

TRADESCANTIA LINN. Gen. 277 (1737).

Ephemerum MOENCH, Meth. 237 (1794).

Knowlesia HASSK. Commel. Ind. 5 (1870).

Descantaria SCHLECHT. Linn. XXVI, 140 (1852).

Heterachthia KUNZE, Bot. Zeit. 1 (1850).

Pyrrheima HASSK. Flora 366 (1869).

Mandonia HASSK. Flora 260 (1871).

Disgrega HASSK. Commel. Ind. 6 (1870),

Skofitzia HASSK. Oest. Bot. Zeitschr. 147 (1872).

Benth. and Hook., *Gen. Pl.* III, 853; Durand, *Ind. Gen. Phan.* 435; Engler and Prantl, *Nat. Pflanz.* 2, IV, 68 (Schönland); Schenck, *Palaeophyt.* 367.

Living species: 32; tropical and temperate America. N. America, 5; S. Sts., 4; E. Sts., 2; Rocky mts., 1.

Fossil species: ? *Commelinacites*, amber (*Conwentz*).

Tradescantia virginica LINN. Spec. 288 (1753).

T. cristata WALT. Fl. Car. 119 (1788).

T. ohioensis RAF. N. Fl. 86 (1836).

Wats. and Coult., *Gray's Man.* 6 ed. 539; Britt., *Fl. N. J.* 248; Webb., *Fl. Neb.* 107; Chap., *Fl. S. St.* 498; Upham, *Fl. Minn.* 149; Coult., *Fl. Colo.* 355; Engl. Schönland, *Nat. Pflanz.* II, 4, 68; Wats., *King Exp.* 359; Roth., *Wheel. Exp.* 274; Cov., *Fl. Ark.* 226.

Mexico to Central America?

North America: N. Y. to Minn., Dak. and Wyoming; S. to Fla. and N. Mex.

Minn. valley: Throughout; meadows and edges of woods.

HERB: *Sheldon* 747, Sleepy Eye; *Taylor* 176, Janesville; *Taglor* 578, Minnesota lake; *Taylor* 783, Glenwood; *Ballard* 368, Helena, Scott Co.; *Ballard* 58, Chaska; *Herrick* 319, Minneapolis; *Herrick* 320, Minneapolis; *Kassube* 250, Minneapolis; *Holzinger* 294, Winona Co.; *Oestlund* 209, Minneapolis; *Sandberg* 597, Cannon Falls; *Herb. Sheld.* 1711, Minneapolis; *Hammond* 50, Lake City; *Wickersheim* 130, Idlewild.

XV. PONTEDERIACEAE. Pickerel-Weed Family.

Endlicher, *Gen. Pl.* 137 (1840); Benth. and Hook., *Gen. Pl.* III, 836 (1883); Schönland in *Engler and Prantl, Nat. Pflanz.* 2, IV, 70 (1887).

Genera: 6; warmer regions, except Europe.

Species: 23; principally tropical.

PONTEDERIA LINN. Gen. 291 (1737).

Unisema RAF. Journ. Phys. LXXXIX, 261 (1819).

Reussia ENDL. Gen. 139 (1840).

Engler and Prantl, *Nat. Pflanz.* 2, IV, 73, 74 (Schönland); Durand, *Ind. Gen. Phan.* 433; Benth. and Hook., *Gen. Pl.* III, 837.

Living species: 3-4; N. America, 1; S. America, 3.

Pontederia cordata LINN. Spec. 288 (1753).

P. mucronata RAF. Med. Rep. XI, 352 (1808).

P. angustifolia PURSH, Fl. Am. I, 233 (1814).

Wats. and Coult., *Gray's Man.* 6 ed. 536; Britt., *Fl. N. J.* 246; Mac., *Fl. Can.* II, 53; Upham, *Fl. Minn.* 149; Chap., *Fl. S. St.* 496; Engl. Schönl., *Nat. Pflanz.* II, 4, 73; Cov., *Fl. Ark.* 226.

North America: N. S., Q., Ont. to L. Huron and Saskatchewan; S. to N. J. and Fla.; W. to Minn., Ark. and Tex.

Minn. valley: N. E. and N. district; forest lakes; local and infrequent.

HETERANTHERA RUIZ and PAV. Prodr, 9, t, 2 (1794).

Schollera SCHREB. Gen. Pl. II, 785 (1791) *not* Roth (1788).

Leptanthus MICHX. Fl. Bor.-Am. I, 24 (1803).

Buchosia VELLOZ. Fl. Flum. 33 (1827).

Benth. and Hook., *Gen. Pl.* III, 838; Durand, *Ind. Gen. Phan.* 433; Engler and Prantl, *Nat. Pflanz.* 2, IV, 74 (Schönland); O. Kuntze, *Rev. Gen.* II, 719.

Living species: 9; tropical Africa; N. and S. America. N. America, 3-4; California, 1; S. Sts., 1; Canada, 1; E. Sts., 3.

Heteranthera dubia (JACQ.).

Commelina dubia JACQ. Icon. (1768).

Schollera graminifolia WILLD. Nov. Act. Soc. Berl. III, 438 (1801).

Leptanthus gramineus MICHX. Fl. N. Am. I, 25 (1803).

Heteranthera graminea VAHL, Enum. II, 45 (1806).

Schollera graminea BARTR. Fl. N. Am. II, 54 (1822).

S. dubia OK. Rev. Gen. II, 719 (1891).

Wats. and Coult., Gray's Man. 6 ed. 536; Britt., Fl. N. J. 247; Mac., Fl. Can. II, 54; Upham, Fl. Minn. 149; Chap. Fl. S. St. 497; Engl. Schönl., Nat. Pflanz. II, 4, 74; Wats., Fl. Calif. II, 187; Wats., King. Exp. 359; Cov., Fl. Ark. 226.

Cuba.

North America: Ont. and Ott. to N. Eng., N. J. and N. Car.; W. to Minn., E. Kan., Ark. and Tex.; also, Oregon and California.

Minn. valley: Throughout; mud beside lakes or streams, or completely aquatic.

HERB.: *Sheldon* 718, Sleepy Eye; *Sheldon* 1430, Lake Benton; *Sheldon* 813, Sigel township, Brown Co.; *Sheldon* 1135, Springfield; *Sheldon* 1508, Lake Benton; *Taylor* 987, Glenwood; *MacMillan* 19, Morton; *Herrick* 318, Minneapolis; *Oestlund* 208, Minnehaha; *Sandberg* 596, Belle Creek.

XVI. JUNCACEAE. Rush Family.

Endlicher, *Gen. Pl.* 130 (1840); Benth. and Hook., *Gen. Pl.* III, 861 (1883); Buchenau in Engler and Prantl, *Nat. Pflanz.* 2, V, 1 (1887).

Genera: 7; 2, cosmopolitan; 5, southern hemisphere.

Species: 190 ±; 5-6, extinct.

JUNCUS LINN. Gen. 295 (1737) p. p.

Tenagaia REICH. Ic Fl. Germ. IX. 22 (1847).

Cephaloxys DESVX. Journ. Bot. I, 324 (1808).

Benth. and Hook., *Gen. Pl.* III, 867; Durand, *Ind. Gen. Phan.* 436; Engler and Prantl, *Nat. Pflanz.* 2, V, 5 (Buchenau); Schenck, *Palaeophyt.* 363.

Living species: 176 (Buch. Mon.); cosmopolitan. Europe, 45; Russia, 35; Russian Europe, 30; North America, 60; Canada, 37-43; E. Sts., 27-30; California, 28-32; Rocky mts., 4-5; Pl. King., 9; Pl. Wheel., 14; S. Sts., 16-20.

Fossil species, 3-4, Tertiary; Greenland and Spitzbergen (*Heer*).

***Juncus tenuis* WILLD.** Spec. II, 214 (1799).

J. gracilis SM. Comp. Fl. Brit. 55 (1800).

J. bicornis MICHX. Fl. N. Am. I, 191 (1803).

J. parviflorus POIR. Enc. Meth. Suppl. III, 160 (1813).

J. macer S. F. GRAY, Nat. Arr. Brit. Pl. II, 164 (1821).

J. aristatus LINK, Enum. 2948 (1822).

J. gesneri SM. Engl. Fl. II, 167 (1824).

J. chloroticus SCHULTES, R. and S. Syst. VII, 240 (1829).

J. smithii KUNTH, Enum. III, 349 (1841).

J. lucidus HOCHST. Fl. Az. 24 (1848).

J. germanorum STEUD. Syn. Glum. II, 305 (1855).

J. vacillans STEUD. Syn. Glum. II, 305 (1855).

J. compressus X *effusus* O. KUNTZE, Tasch. Fl. Leip. 55 (1867).

Wats. and Coult., Gray's Man. 542; Britt., Fl. N. J. 250; Mac., Fl. Can. II, 59; Upham, Fl. Minn. 148; Chap., Fl. S. St. 493; Wats., Fl. Calif. II, 207; Buch., Mon. Junc. 193; Coult. Fl. Colo. 358; Webb., Fl. Neb. 107; Webb., Fl. Neb. 197; Richt., Pl. Eur. 177; Hook., Fl. Gt. Brit. 416; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 136; Wats., King. Exp. 493; Roth., Wheel. Exp. 273; Cov. Fl. Ark. 227.

Central Europe; Tristan d'Acunha and New Zealand (intro. ?).

North America: N. S., to Hudson Bay, Saskatchewan, Bear lake and Vancouver; S. to Oregon, S. Calif. and N. Mex.; E. to N. Eng., Fla. and W. Indies.

Minn. valley: Throughout; abundant; low marshy or damp places.

HERB.: *Sheldon* 878, Sleepy Eye; *Sheldon* 1443, Pipestone; *Ballard* 432, Prior's lake, Scott Co.; *Sheldon* 1366, Lake Benton; *Taylor* 635, Minnesota lake; *Herrick* 317, Minneapolis; *Bailey* 125, Vermilion lake; *Oestlund* 205, Ramsey Co.; *Bailey* 486, Agate bay; *Sandberg*, 594, Red Wing; *MacM. and Sheld.* 67, Brainerd.

***Juncus vaseyi* ENGELM.** Rev. N. Amer. Junc. II, 448 (1866).

Wats. and Coult., Gray's Man 6 ed. 542; Upham, Fl. Minn. 148; Coult., Fl. Colo. 358; Buch., Mon. Junc. 201; Engl. Buch., Nat. Pflanz. II. 5, 5; Wats., King Exp. 492; Mac., Fl. Can. II, 58.

North America: Lake Nipigon to Saskatchewan and

Brandon, Man.; S. to Colo.; E. to Ill., Minn., Mich. and in N. Maine.

Minn. valley: Reported from forest district and S. E. edge; infrequent; wet meadows.

Juncus balticus WILLD. var. **litoralis** ENGELM. Rev. Amer. Junc. II, 441 (1866).

Wats. and Coult., Gray's Man. 6 ed. 540; Mac., Fl. Can. II, 56; Upham, Fl. Minn. 148; Wats., Fl. Calif. II, 205; Coult., Fl. Colo. 357; Buch., Mon. Junc. 215; ? Hook., Fl. Gt. Brit. 415; Miyabe, Fl. Kur. 266?; Roth., Wheel. Exp. 272?; Hart., Fl. Scand. I, 420 (spec.); Rothr., Alask. 457?.

S. America, Patagonia; Pyrenees mts. (*spec.*).

North America: N. S., Q., to L. Huron and L. Winnipeg; S. to Mass., Penn., Minn., Ohio, and Colo.?

Minn. valley: Reported from forest district; infrequent; marshes and swamps.

HERB.: ? *Oestlund* 204, Ramsey Co.

Juncus filiformis LINN. Spec. 326 (1753).

J. arcticus LAP. Abr. 193 (1813).

J. trichodes STEUD. Syn. Glum. II, 306 (1855).

J. transilvanicus SCHUR. Enum. 684 (1866).

Wats. and Coult., Gray's Man. 6 ed. 540; Webb., Fl. Neb. 107; Mac., Fl. Can. II, 55; Upham, Fl. Minn. 148; Coult., Fl. Colo. 357; Buch., Mon. Junc. 224; Richt., Pl. Eur. 178; Led., Fl. Ross. IV, 223; Hook., Fl. Gt. Brit. 415; Herd., Fl. Eur. Russ. 136; Engl. Buchenau, Nat. Pflanz. II, 5, 5; Mac., Fl. Can. II, 365; Wats., King Exp. 492; Hart. Fl. Scand. 420.

Europe to Apennines; N. Asia; Patagonia.

North America: Greenland and Newf. to Little Slave lake, Bear lake and Brit. Col.; Selkirk summits; S. to N. Eng., Mich., Minn., Neb. and Colo.

Minn. valley: Reported from N. E. district; rare; marshes and swamps.

HERB.: *Bailey* 17, Vermilion lake; *Roberts* 135, Knife river.

Juncus effusus LINN. Spec. 326 (1753).

J. conglomeratus LINN. Spec. 326 (1753) *pro parte*.

J. bogotensis HBK. N. Gen. Et. Spec. I, 235 (1815).

J. communis var. *effusus* E. MEY. Mon. Junc. 20 (1819).

J. laevis var. *effusus* WALLR. Sched. Crit. I, 142 (1822).

J. aemulans LIEBM. Mex. Junc. 38 (1850).

Wats. and Coult., Gray's Man. 6 ed. 540; Britt., Fl. N. J. 249; Mac., Fl. Can. II, 55; Upham, Fl. Minn. 148; Chap., Fl. S. St. 493; Buch., Mon. Junc. 228; Led., Fl. Ross. IV, 221; Hook., Fl. Gt. Brit. 414; Richt., Pl. Eur. 178; Nym., Fl. Eur.; Miyabe, Fl. Kur. 266; Herd., Fl. Eur. Russ. 136; Engl. Buch., Nat. Pflanz. II, 5, 5; Wats., King Exp. 491; Cov., Fl. Ark. 226; Hart., Fl. Scand. I, 419-420.

Europe; Asia; Africa; Australia; Central America.

North America: Newf., Hudson Bay to Vancouver; S., E. of Rocky mts., to Gulf of Mex. and Fla.

Minn. valley: N. edge; marshy or swampy ground; rare.

HERB.: *Bailey* 520, Agate Bay; *Sandberg* 593, Chisago Co.

Juncus nodosus LINN. var. **genuinus** ENGELM. Rev. Junc. II, 471 (1868).

J. rostkovii E. MEY. Syn. Junc. 26 (1822).

J. nodosus Auct.

Wats. and Coult., Gray's Man. 6 ed. 545; Britt., Fl. N. J. 251; Mac., Fl. Can. II, 634—excl. syn.; Upham, Fl. Minn. 149; Webb., Fl. Neb. 107; Wats., Fl. Calif. II, 208; Coult., Fl. Colo. 358; Buch., Mon. Junc. 314, 316; ?Led., Fl. Ross. IV, 235; Wats., King Exp. 494; Cov., Fl. Ark. 227; Webb., Appx. Neb. 25.

S. Russia ?

North America: N. S., N. Br., Hudson Bay, Bear lake to Brit. Col. and Saskatchewan; S. to Oregon and Calif.; S. to Minn., Iowa, N. Ind., Neb., Ark.; E. to N. Eng. and N. J.

Minn. valley: Throughout; common; marshes, swamps and banks.

HERB.: *Ballard* 837, Page lake, Carver Co.; *Ballard* 896, St. Bonifacius; *Taylor* 1085, Glenwood; *Sheldon* 1158, New Ulm; *Taylor* 639, Minnesota lake; *Sheldon* 1397, Verdi, Lincoln Co.; *Sheldon* 1458, Pipestone; *Sandberg* 595, Red Wing; *Oestlund* 206, Hennepin Co.; *Oestlund* 207, Ramsey Co.; *MacM.* and *Sheld.* 23, Brainerd.

Juncus nodosus LINN. var. **megacephalus** TORR. Fl. N. Y. II, 327 (1843).

J. megacephalus WOOD, Bot. 724 (1861).

Wats. and Coult., Gray's Man. 6 ed. 545; Britt., Fl. N. J. 251; Mac., Fl. Can. II, 63; Upham, Fl. Minn. 149; Coult., Fl. Colo. 358; Buch., Mon. Junc. 316; Wats., Fl. Calif. II, 208; Roth., Wheel. Exp. 273.

North America: Ont. to Saskatchewan, Colo., Oregon, Nev., Arizona, Calif. and Tex.; E. to N. Y., Ohio and N. J.

Minn. valley: Throughout; principally westward; habitat with the type.

HERB.: *Sheldon* 1032a, New Ulm; *Sheldon* 1071, Springfield; *Sheldon* 1462, Pipestone.

Juncus canadensis J. GAY, var. **coarctatus** ENGELM. Rev. Junc. 474 (1868).

J. paradoxus AUCT. AMER. in part.

J. acuminatus AUCT. AMER. before ENGELM. not Michx.

Wats. and Coult., Gray's Man. 6 ed. 546; Buchenau, Mon. Junc. 271; Mac., Fl. Can. II, 63; Britt., Fl. N. J. 251; Coult., Fl. Colo. 358.

North America: N. S., N. E. T. and Ont. to N. Eng. and N. J.; W. to Minn., Colo. and Mont.

Minn. valley: Forest district; wet meadows and banks.

HERB.: *Taylor* 85, Elysian; *Sheldon* 205, Madison Lake; *Bailey* 276, St. Louis river; *MacM.* and *Sheld.* 68, Brainerd; *Juni* 27, Little Marais.

***Juncus canadensis* J. GAY var. *longicaudatus* ENGELM.** Rev. Junc. II, 474 (1868).

J. paradoxus AUCT. AMER.

J. polycephalus var. *paradoxus* TORR. Fl. N. Y. II, 327 (1843).

Wats. and Coult., Gray's Man. 6 ed. 545; ?Britt., Fl. N. J. 251; Upham, Fl. Minn. 149; Mac., Fl. Can. II, 64; Coult., Fl. Colo. 358; Buch., Mon. Junc. 271; Wats., King Exp. 495; Cov., Fl. Ark. 227.

Central Amer. to Venezuela?

North America: N. Br., Ont. to S. Ste. Marie and Minn.; E. to Mass. and N. J.; S. to S. Car. and La.; W. to Ark.

Minn. valley: Forest district; Ft. Snelling to Blue Earth Co.; wet places.

HERB.: *Juni* 17, Little Marais; *Bailey* 276, St. Louis river; *Taylor* 637, Minnesota lake.

***Juncus acuminatus* MICHX. var. *legitimus* ENGELM.** Rev. Junc. II, 435 (1868).

J. acuminatus MICHX. Fl. N. Am. I, 192 (1803).

J. pallescens E. MEY. Syn. Junc. 31 (1822).

J. paradoxus E. MEY. Syn. Junc. 30 (1822).

J. fraternus KUNTH, Enum. III, 340 (1841).

J. debilis GRAY, Man. ed. II, 480 (1856) *pro parte*.

J. pondii WOOD, Bot. 724 (1861).

Wats. and Coult., Gray's Man. 6 ed. 544; Britt., Fl. N. J. 250; Upham, Fl. Minn. 148; Mac., Fl. Can. II, 62; Buch., Mon. Junc. 333; Chap., Fl. S. St. 494; Wats., King Exp. 494; Cov., Fl. Ark. 226.

North America: N. Eng. to Ont. and Minn.; S. to N. J. and Ga.; W. to Kan., Nev.? and Tex.

Minn. valley: Forest district; infrequent; wet places and meadows.

HERB.: *Ballard* 280, Jordan, Scott Co.

CYPERELLA CRAM. Tent. Bot. 41 (1744).

***Juncastrum* HEIST.** Syst. 12 (1748).

***Ischaemon* SCHMIED.** Gesn. Hist. Pl. 13 (1759) *not Linn.*

***Luzula* DC.** Fl. Fr. III, 158 (1805).

***Juncodes* ADANS.** Fam. II, 47 (1763).

***Leucophoba* EHRH.** Phyt. n. 73 (1793).

***Luciola* SM.** Eng. Fl. II, 177 (1824).

Benth. and Hook., *Gen. Pl.* III, 436; Durand, *Ind. Gen. Phan.* 436; Engler and Prantl, *Nat. Pflanz.* 2, V, 7 (Buchenau); O. Kuntze, *Rev. Gen.* II, 722.

Living species: 40±; temperate regions and tropical mts. Europe, 26; Russia, 10; Russian Europe, 10; Canada, 8-10; California, 5; E. Sts., 5; Rocky mts., 6; S. Sts., 3; Pl. King, 4; U. S., 10.

Cyperella campestris (LINN.) var. multiflora (EHRH.).

Juncus campestris var. *G.* LINN. Spec. ed. 2, 469 (1762).

Juncus multiflorus EHRH. Calam. Exsicc. (1791).

J. intermedius THUILL. Fl. Par. Env. 178 (1799).

J. erectus PERS. Syn. I, 386 (1805).

J. nemorosus HOST. Icon. Gram. 97 (1805).

Luzula erecta DESV. Mem. Luz. 156 (1808).

L. multiflora LEJ. Fl. Env. Spa, 169 (1811).

L. intermedia var. *multiflora* SPENN. Fl. Frib. 177 (1825).

L. pallescens HOPPE, Sturm. Deutsch. Fl. XVIII, 77 (1839).

L. campestris AUCT. AMER. et VET. ORB.

L. campestris vars. *pallescens* and *comosa* MAC. Fl. Can. II, 67 (1888).

L. campestris DC. var. *multiflora* L. CELAKOV. Prodr. Böhm. 85 (1869).

Wats. and Coult., Gray's Man. 6 ed. 546; Buchen., Mon. Junc. 161; Britt., Fl. N. J. 251; Upham, Fl. Minn. 148; Chap., Fl. S. St. 493; Wats., Fl. Calif. II, 203; Richt., Pl. Eur. 186; Led., Fl. Ross. IV, 216; Hook., Fl. Gt. Brit. 420; Miyabe, Fl. Kur. 267; Herd., Fl. Eur. Russ. 136; Engl. Buchen., Nat. Pflanz. II, 5, 7; Wats., King Exp. 355; Cov., Fl. Ark. 227; Hart., Fl. Scand. I, 426; Rothr., Alask. 456.

Europe; Asia; N. Africa; N. Zealand.

North America: Greenland to Alaska; S. to Plumas Co., Calif. From N. Eng. to Fla and W. to Minn., Ark. and Texas.

Minn. valley: Forest district; rare; dry fields and hills.

HERB.: *Sandberg 592*, Chisago Co.; *Sheldon 1621*, Twin lake, Hennepin Co.

XVII. LILIACEAE. Lily Family.

Endlicher, *Gen. Pl.* 133, 139, 152 (1840); Benth. and Hook., *Gen. Pl.* III, 748 (1883); Engler in Engler and Prantl, *Nat. Pflanz.* 2, V, 10 (1887).

Genera: 200; cosmopolitan; most abundant in sub-tropical and temperate regions. Extinct, 6-7.

Species: 2500; extinct, 100-150; doubtful.

TOFIELDIA HUDS. Fl. Angl. ed. 2, 157 (1778).

Heriteria SCHRANK, Baier. Fl. I, 133 (1789).

Hebelia GMEL. Fl. Bad. II, 117 (1806).

Triantha NUTT. Gen. I, 235 (1818).

Isidrogalvia R. and P. Fl. Per. and Chile, III, 69 (1802).

Benth. and Hook., *Gen. Pl.* III, 828; Durand, *Ind. Gen. Phan.* 431; Engler and Prantl, *Nat. Pflanz.* 2, V, 20 (Engler).

Living species: 14; N. temperate and Arctic regions, and in the Andes. Japan, 5; N. America, 3; Canada, 1; S. Sts., 3; California, 2; Himalayas, 1; Andes, 1-2.

Tofieldia glutinosa (MICHX.) WILLD. Spec. IV (1805).

Narthecium glutinosum MICHX. Fl. N. Am. I, 210 (1803).

Melanthium aspericaule POIR. ex Steud. Nom. II, 690 (1813?).

Wats. and Coult., Gray's Man. 6 ed. 532; Upham., Fl. Minn. 145; Mac., Fl. Can. II, 44; Wats., Fl. Calif. II, 184; Chap., Fl. S. St. 492; Coult., Fl. Colo. 354; Led., Fl. Ross. IV, 211; Rothr., Alask. 456.

Arctic Russia, Kamtk. and Siberia.

North America: Anticosti, N. Br., Q., Ont. to Man., Athabasca, Hudson Bay, Bear Lake and Alaska; W. to Rocky mts.; S. to California and Oregon; Wyoming; S. to Minn., Mich., Ind., N. Y., Maine and in Alleghenies to Tenn. and N. Car.

Minn. valley: N. and forest districts; moist grounds and shaded banks.

HERB.: *Taylor* 733, Glenwood; *Herrick* 305, Minneapolis; *Herrick* 306, Minneapolis; *Sandberg* 572, Goodhue Co.; *Herb. Sheld.* 1755, Ramsey Co.; *Kassube* 224, Minneapolis.

ZIGADENUS MICHX. Fl. N. Am. I, 213 (1803).

Monadenus and **Chitonia** SALISB. Fragm. 51 (1822?).

Anticlea and **Amiantanthium** KUNTH, Enum. IV, 179, 191 (1843).

Amiantanthium A. GRAY, Ann. Lyc. N. Y. IV, 121 (1837).

Chrosperma RAF. ex Engler. l. c. (1887).

Endooles SALISB. Fragm. (1822?).

Stenanthium A. GRAY, Ann. Lyc. N. Y. IV, 119 (1837).

Schoenocaulon A. GRAY, Ann. Lyc. N. Y. IV, 127 (1837).

Asagraya LINDL. Bot. Reg. t. 33 (1839).

Sabadilla BRANDT, Hayne, Arzneig. XIII, f. 27 (1836).

Benth. and Hook., *Gen. Pl.* III, 835, 836; Durand, *Ind. Gen. Phan.* 432; Engler and Prantl, *Nat. Pflanz.* 2, V, 23, 24 (Engler).

Living species: 20; N. America and Mexico, 17; C. Amer., 1; Saghalin, 1; Siberia, 1; E. Sts., 11; California, 3-4; S. Sts., 5-6; Canada, 4-5; Rocky mts., 5.

Zigadenus elegans PURSH, Fl. Am. 241 (1814).

Z. chloranthus RICH. Hook. Fl. Bor.-Am. II, 177 (1840).

Z. glaucus HOOK. Fl. Bor.-Am. II, 178 (1840).

Wats. and Coult., Gray's Man. 6 ed. 535; Mac., Fl. Can. II, 52; Upham, Fl. Minn. 144; Webb., Fl. Neb. 107; Chap., Fl. S. St. 488; Coult., Fl. Colo. 353; Wats., Fl. Calif. II, 183; Engl., *Nat. Pflanz.* II, 5, 24; Roth., *Wheel. Exp.* 271.

North America: Newf., Anticosti, to N. Eng. and N. J.; W. to Oregon and Behring's Straits, 62° 45' N. lat.; S. to Nev., N. Mex., Arizona, Neb., Ill., Minn. and Tex.?

Minn. valley: Throughout; common; grassy places, fields, hillsides and meadows.

HERB.: *Sheldon* 744, Sleepy Eye; *Sheldon* 553, Waseca; *Sheldon* 1539, Lake Benton; *Taylor* 472, Janesville; *Ballard* 166, Shakopee; *Sandberg* 571, Red Wing; *Oestlund* 198, Hennepin Co.; *Herrick* 304, Minneapolis; *Kassube* 240, Minneapolis; *Herb. Sheld.* 1918, Ramsey Co.; *Herb. Moyer* 237, Camp Release, Chippewa Co.

MELANTHIUM LINN. Gen. ed. II, Appx. (1742).

Leimanthium WILLD. Gesell. Nat. Berl. Mag. II, 24 (1802).

Benth. and Hook., *Gen. Pl.* III. 834; Durand, *Ind. Gen. Phan.* 432; Engler and Prantl, *Nat. Pflanz.* 2, V, 24 (Engler).

Living species: 3; Atlantic N. America. E. Sts., 3; Canada, 1; S. Sts., 1.

Melanthium virginicum LINN. Spec. 339 (1753).

Helonias virginica SIMS, Bot. Mag. 285 (—)?

Leimanthium virginicum WILLD. Mag. Naturf. II, 24 (1808).

Zygadenus virginicus KUNTH, Enum. IV, 195 (1843).

Melanthium hybridum PURSH, Fl. Am. 242 (1814).

Leimanthium hybridum HOOK. Fl. Bor.-Am. II, 177 (1840).

Wats. and Coult., Gray's Man. 6 ed. 533; Mac., Fl. Can. II, 51; Britt., Fl. N. J. 245; Chap., Fl. S. St. 488; Engl. Nat. Pflanz. II, 5, 24; Cov., Fl. Ark. 226.

North America: Ont.? to N. Eng.; S. to N. Car. and Fla.? W. to Minn., Ark. and Tex.

Minn. valley: Reported from N. E. district; rare or doubtful; wet meadows.

VERATRUM LINN. Gen. 769 (1737).

Acedilanthus TRAUTV. Midden. Reise, Fl. Okh. 94 (1864?).

Benth. and Hook., *Gen. Pl.* III. 834; Durand, *Ind. Gen. Phan.* 432; Engler and Prantl, *Nat. Pflanz.* 2, V, 24 (Engler).

Living species: 9; forest regions of N. hemisphere. Russia, 4; Europe, 2; N. America, 5; California, 2; E. Sts., 3; Canada, 1; S. Sts., 3; Rocky mts., 1; Pl. King, 2; Pl. Wheel., 2.

Veratrum viride AIT. Hort. Kew. III, 896 (1789).

V. album MICHX. Fl. N. Am. I, 249 (1803).

Helonias viridis SIMS, Bot. Mag. 1096 (—)?

Veratrum eschscholtzii GRAY, in Rothr. Alask. 456 (1867).

V. album var. *eschscholtzii* DAWSON, Bound Rep. 374 (1875).

? *V. album* var. *viridis* REGEL, Fl. Ussur. 153 (1862).

Wats. and Coult., Gray's Man. 6 ed. 534; Britt., Fl. N. J. 245; Mac., Fl. Can. II, 51; Upham, Fl. Minn., 144; Chap., Fl. S. St. 489; Wats., Fl. Calif. II, 182; Trautv., Fl. Sib. 115?; Wats., King Exp. 344; Engl., Nat. Pflanz. II, 5, 24.

Valley of the Lena river in Siberia?

North America: N. Br., Q., Ont. to Man., Brit. Col., Vancouver and Sitka, Alaska; S. to Oregon; E. to Mo., Ga. and Atlantic coast.

Minn. valley: Reported from N. edge; rare; swamps and marshes.

UVULARIA LINN. Gen. 263 (1737).

Oakesia S. WATS. Proc. Am. Acad. XIV, 269 (1879), *not Tuck.*

Benth. and Hook., *Gen. Pl.* III, 830; Durand, *Ind. Gen. Phan.* 431; Engler and Prantl, *Nat. Pflanz.* 2, V, 27 (Engler).

Living species: 4; Atlantic N. America.

Uvularia grandiflora SM. Exot. Fl. 99 (1804).

? *U. lanceolata* WILLD. Spec. II, 94 (1799).

U. perfoliata var. *major* MICHX. Fl. I, 199 (1803).

Wats. and Coult., Gray's Man. 6 ed. 528; Upham, Fl. Minn. 145; Mac., Fl. Can. II, 45; Chap., Fl. S. St. 487; Engl., Nat. Pflanz. II, 5, 27; Cov., Fl. Ark. 225.

North America: Q., Ont. to Owen Sound and Lake Huron; S. to N. Eng., N. Y. and Ga.; W. to Minn., Mo. and Ark.

Minn. valley: Throughout; woods and shaded banks of lakes and streams.

HERB.: *Ballard* 78, Chaska; *Oestlund* 199, Ramsey Co.; *Kassube* 241, Minneapolis; *Herrick* 308, Minneapolis; *Bailey* 233, Vermilion lake; *Sandberg* 575, Goodhue Co.; *Hammond* 42, Lake City; *Herb. Moyer* 238, Montevideo.

Uvularia perfoliata LINN. Spec. 304 (1753).

U. perfoliata var. *minor* MICHX. Fl. Am. I, 199 (1803).

Wats. and Coult., Gray's Man. 6 ed. 527; Britt., Fl. N. J. 244; Mac., Fl. Can. II, 44; Chap., Fl. S. St. 487.

North America: Ont.? to N. Eng., N. J. and Fla.; W. to Minn., Dak. and Mo.

Minn. valley: Throughout; woods and shaded banks of lakes and streams; abundant.

HERB.: *Taylor* 136, Janesville; *Sheldon* 144, Madison Lake, Blue Earth Co.; *Herrick* 307, Minneapolis; *Sandberg* 573, Red Wing; *Sandberg* 574, Cannon Falls; *Herb. Sheld.* 1893, Minneapolis; *Herb. Wickersheim* 123, Idlewild, Lincoln Co.

Uvularia sessilifolia LINN. Spec. 305 (1753).

Oakesia sessilifolia S. WATSON, Proc. Am. Acad. XIV, 269 (1879).

Wats. and Coult., Gray's Man. 6 ed. 528; Britt., Fl. N. J. 244; Mac., Fl. Can. II, 45; Upham, Fl. Minn. 145; Webb., Fl. Neb. 107; Chap., Fl. S. St. 487; Cov., Fl. Ark. 225.

North America: N. Br., Q., Ont. to N. Eng., N. J. and Fla.; W. to Minn., Dak., Neb., Kan. and Ark.

Minn. valley: Throughout; principally in forest district; woods and shaded banks of lakes and streams.

HERB.: *Sandberg* 576, Black Oak, Goodhue Co.; *Sandberg* 577, Goodhue Co.; *Holzinger* 282, "western Minnesota"; *Kassube* 242, Ramsey Co.; *Herb. Sheld.* 1706, Minneapolis; 1896, Ramsey Co.

ALLIUM LINN. Gen. 294 (1737).

Hexonychia, Calliprena, Raphione, Xylorhiza, Berenice, Porrum, Cepa, Phyllodolon, Camarilla, Schoenissa, Butomissa, Hylogeton, Molyza, Canidia, Julus, Saturnia, Briseis SALISB. *Fragm. Gen.* 88-94 (1822?).

Schoenoprasum HBK. *Nov. Gen. et Spec.* I, 277 (1815).

Codonoprasum REICHB. *Fl. Germ. Exc.* 114 (1830).

Ophioscorodon WALLR. *Sched. Crit.* 129 (1822).

Moenchia MEDIC. *Act. Palat.* VI, 343 (—).

Moly MOENCH, *Meth.* 286 (1794).

Saturnia MARATTI, *Diss. Romul.* 18, t. 2 (1772).

Nectaroscordum LINDL. *Bot. Reg.* t. 1912 (1836).

Trigonea PARLAT. *Occhio*, 161 (1839).

Benth. and Hook., *Gen. Pl.* III, 802; Durand, *Ind. Gen. Phan.* 427; Engler and Prantl, *Nat. Pflanz.* 2, V, 55 (Engler).

Living species: 250; S. and Mid. Europe; extra-tropical Asia; N. Africa; N. America to Mexico. Europe, 80; Russia, 73; European Russia, 40; N. America, 30-35; California, 25; Canada, 10; S. Sts., 7-8; Rocky mts., 14; E. Sts., 7; Pl. King, 8; Pl. Wheel., 6; S. America, 3-4; centers in Himalaya region.

Allium canadense KALM, *Linn. Spec.* 1195 (1762).

Wats. and Coult., *Gray's Man.* 6 ed. 522; Britt., *Fl. N. J.* 241; Upham, *Fl. Minn.* 147; Mac., *Fl. Can.* II, 36; Webb., *Fl. Neb.* 108; Coult., *Fl. Colo.* 348; Chap., *Fl. S. St.* 482; Wats., *King. Exp.* 487; Cov., *Fl. Ark.* 225.

North America: N. Eng., Ont. to Minn.; S. to N. J. and Fla.; W. to Dak., Neb. and Tex.

Minn. valley: Throughout; common; wet fields and along bases of hills.

HERB.: *Taylor* 518, Mud lake, Waseca Co.; *Taylor* 621, Minnesota lake; *Ballard* 106, Carver; *Ballard* 355, Helena, Scott Co.; *Sandberg* 591, Vasa; *MacM. and Sheld.* 66, Brainerd; *Herb. Sheld.* 1916, Minneapolis; *Herb. Moyer* 242, Montevideo.

Allium stellatum NUTT. *Gen. I*, 214 (1818).

Wats. and Coult., *Gray's Man.* 6 ed. 522; Upham, *Fl. Minn.* 147; Mac., *Fl. Can.* II, 36; Coult., *Fl. Colo.* 348; Webb., *Fl. Neb.* 108; Wats., *King Exp.* 486.

North America: Saskatchewan and Brit. Col. to Wyoming, Neb., Dak., Minn., W. Ills. and Mo.

Minn. valley: Prairie district and far N. E.; N. edge; high bluffs and headlands.

HERB.: *Sheldon* 1202, New Ulm; *Sheldon* 1518a, Lake Benton; *Sheldon* 952, Redwood Falls; *Sheldon* 1472, Pipestone, *Sheldon* 971, Sleepy Eye; *Gedge* 16, Tracy, Lyon Co.; *Oestlund* 203, Minneapolis.

Allium cernuum ROTH, Cat. Fasc. II, 2 (1800).

? *A. tricornu* POIR. Suppl. Enc. Meth. I, 270 (1810).

A. stellatum HOOK. Fl. Bor.-Am. II, 184 (1840) in part.

Wats. and Coult., Gray's Man. 6 ed. 522; Upham, Fl. Minn. 147; Mac., Fl. Can. II, 35; Chap., Fl. S. St. 482; Coult., Fl. Colo. 347; Roth., Wheel. Exp. 269; Wats., King Exp. 486.

North America: Lake of the Woods and Souris river to Brit. Col., Vancouver and Nootka; S. to Oregon and N. Mex.; E. to S. Car. and Alleghenies.

Minn. valley: Prairie district and N. W. and N. E. districts; rather rare; plains and sunny banks.

HERB.: *Taylor* 876, Glenwood; *Holzinger* 293, Winona; *Kassube* 249, Minneapolis; *Sandberg* 590, Goodhue Co.

Allium schoenoprasum LINN. Spec. 301 (1753).

Cepa schoenoprasum MOENCH, Meth. 244 (1794).

Allium foliosum CLAR. Red. Lil. 24 (1802).

A. acutum SPRENG. Pug. I, 28 (1813).

A. tenuifolium POHL. Tent. Fl. Böhm. II, 10 (1815).

A. palustre POURR. in Lag. Pl. Matr. 13 (1816).

A. sibiricum R. and S. Syst. VII, 1027 (1829).

A. sibiricum schoenoprasoides FR. in Kunth, Enum IV, 685 (1841).

A. schoenoprasum var. *alpinum* KOCH, Syn. ed. 2, 833 (1845).

A. punctulatum SCHLECHT. Linn. XIX, 401 (1847).

Wats. and Coult., Gray's Man. 6 ed. 522; Mac., Fl. Can. II, 35; Upham, Fl. Minn. 147; Coult., Fl. Colo. 347; Led., Fl. Ross. IV, 166; Richt., Pl. Eur. 202; Nym., Fl. Eur.; Hook., Fl. Gt. Brit. 406; Herd., Fl. Eur. Russ. 132; Engl., Nat. Pflanz. II, 5, 56; Wats., King Exp. 485; Hart., Scand. Fl. I, 407; Rothr., Alask. 456.

All Europe and Siberia to Himalayas and Japan.

North America: Labrador to Bear lake and the Yukon at lat. 63° N.; S. to Brit. Col., Oregon and Wyoming; E. to Dak., Minn., Gt. Lakes, N. Br. and N. S.

Minn. valley: Reported from N. edge; rare; shores of forest lakes and river banks.

Allium tricoccum AIT. Hort. Kew. I, 428 (1789).

Wats. and Coult., Gray's Man. 6 ed. 521; Britt., Fl. N. J. 241; Chap., Fl. S. St. 482; Upham, Fl. Minn. 147; Mac., Fl. Can. II, 34; ? Wats., King Exp. 485.

North America: Ont. to N. of Lake Superior; S. to W. N. Eng., N. J. and mts. of N. Car.; W. to Minn. and Iowa.

Minn. valley: Throughout; not infrequent; woods and banks of streams and lakes.

HERB.: *Taylor* 622, Minnesota lake; *Ballard* 291, Jordan, Scott Co.; *Taylor* 127, Janesville; *Sheldon* 289, Madison Lake, Blue Earth Co.; *Sheldon* 698, Waseca; *Sheldon* 1007, Sleepy Eye; *Herrick* 316, Minneapolis; *Holzinger* 292, Winona Co.; *Sandberg* 589, Vasa.

LILIUM LINN. Gen. 258 (1737).

Martagon SALISB. Gen. Pl. Fragm. 56 (1822?).

Notholirion BOISS. Fl. Or. V, 190 (1867).

Benth. and Hook., *Gen. Pl.* III, 816; Durand, *Ind. Gen. Phan.* 430; Engler and Prantl, *Nat. Pflanz.* 2, V, 60 (Engler).

Living species: 45; temperate regions, N. hemisphere. Russia, 10; Europe, 7; N. America, 14; Atl. region, 5; Pac. region, 9; Rocky mts., 1; S. Sts., 5-6; Canada, 4. E. Asia, 25±.

Lilium canadense LINN. Spec. 303 (1753).

L. pardalinum var. *bourgei* BAKER, Linn. Journ. XIV, 242 (1875).

Wats. and Coult., Gray's Man. 6 ed. 529; Britt., Fl. N. J. 242; Upham, Fl. Minn. 146; Webb., Fl. Neb. 108; Mac., Fl. Can. II, 38; Chap., Fl. S. St. 484; Engl., Nat. Pflanz. II, 5, 61; Wats., King Exp. 346.

North America: N. S., N. Br., Q., Ont. to Ft. Francis on Rainy Lake river; S. to N. Eng., N. J., Ga.; W. to Minn., Neb., Mo.

Minn. valley: Throughout; principally forest district; moist fields, bogs and marshy meadows.

HERB.: *Ballard* 410, New Prague, Scott Co.; *Taylor* 261, Janesville; *Taylor* 718, Minnesota lake; *Sheldon* 401, Madison Lake, Blue Earth Co.; *Oestlund* 202, Ramsey Co.; *Kassube* 248, Minneapolis; *Herrick* 315, Minneapolis; *Sandberg* 587, Cannon Falls; *Sheldon* 450, Duck lake, Blue Earth Co.

Lilium superbum LINN. Spec. ed. 2, 435 (1762).

L. carolinianum MICHX. Fl. I, 197 (1803).

L. canadense var. *superbum* ELWES, Mon. Lil. 21 (1878).

Wats. and Coult., Gray's Man. 6 ed. 529; Britt., Fl. N. J. 242; Chap., Fl. S. St. 484; Upham, Fl. Minn. 146; Engl., Nat. Pflanz. II, 5, 61; Cov., Fl. Ark. 225; Mac., Fl. Can. II, 39.

North America: W. Ont. and N. Eng. to N. J. and Ga.; W. to Minn., Mo. and Ark.

Minn. valley: Forest district; Ft. Snelling to Blue Earth Co.; low grounds and meadows.

HERB.: *Holzinger* 288, Winona.

Lilium philadelphicum LINN. Spec. ed. 2, 435 (1762).*L. umbellatum* PURSH, Fl. Am. 229 (1814).

Wats. and Coult., Gray's Man. 6 ed. 529; Britt., Fl. N. J. 242; Upham, Fl. Minn. 146; Mac., Fl. Can. II, 38; Chap., Fl. S. St. 484; Coult., Fl. Colo. 351; Engl., Nat. Pflanz. II, 5, 61; Roth., Wheel. Exp. 269; Cov., Fl. Ark. 225.

North America: Ont. to L. Huron, Saskatchewan, prairie region and Rockies and Columbia valley, Brit. Col.; S. to Colo. in Rocky mts.; E. to Minn., Ark., N. Eng., N. J. and N. Car.

Minn. valley: Throughout; common; fields, prairies; forest openings and hillsides; principally forest district.

HERB.: *Taylor 554*, Minnesota lake; *Sheldon 640*, Waseca; *Sheldon 697*, Waseca; *Ballard 263*, Jordan, Scott Co.; *Ballard 460*, Prior's lake, Scott Co.; *Sandberg 585*, Chisago Co.; *Kassube 247*, Minneapolis; *Roberts 134*, Split Rock; *Leonard 47*, Spring Valley; *Bailey 386*, Mud lake; *Sandberg 586*, Cannon Falls; *Herb. Sheld. 1695*, Minneapolis; *Herb. Wickersheim 127*, Idlewild, Lincoln Co.; *Herb. Moyer 241*, Minnesota valley.

ERYTHRONIUM LINN. Gen. 262 (1737).

Benth. and Hook., *Gen. Pl.* III, 819; Durand, *Ind. Gen. Phan.* 430; Engler and Prantl, *Nat. Pflanz.* 2, V, 63 (Engler).

Living species: 7; 1, Europe, Russian Asia and Japan; 6, N. America; Canada, 4-5; S. Sts., 2; California, 3-4 (1 endemic.); Rocky mts., 1.

Erythronium albidum NUTT. Gen. I, 223 (1818).

Wats. and Coult., Gray's Man. 6 ed. 528; Britt., Fl. N. J. 243; Mac., Fl. Can. II, 41; Upham, Fl. Minn. 146; Webb., Fl. Neb. 107; Cov. Fl. Ark. 225.

North America: Ont. to N. Y., N. J.; W. to Minn., Neb. and Kan.

Minn. valley: Throughout; infrequent; low woods, shaded banks and hillsides.

HERB.: *Sandberg 588*, Vasa; *Manning 9*, Lake City; *Holzinger 290*, Winona Co.; *Herb. Wickersheim 128*, Lake Benton; *129*, Mankato.

Erythronium americanum SM.

E. dens-canis var. *g.* LINN. Spec. ed. 2, 437 (1762).

E. lanceolatum PURSH, Fl. Am. I, 230 (1814).

Wats. and Coult., Gray's Man. 6 ed. 528; Britt., Fl. N. J. 242; Mac., Fl. Can. II, 41; Upham, Fl. Minn. 146; Chap., Fl. S. St. 484; Engl., Nat. Pflanz. II, 5, 63; Cov., Fl. Ark. 225.

North America: N. S., Q., Ont. to Owen Sound and Georgian Bay; S. to N. Eng., N. J. and Fla.; W. to Minn., Mo. and Ark.

Minn. valley: Forest district; St. Paul to Blue Earth Co.; thickets, copses and rich woodland.

HERB.: *Holzinger* 289, Winona Co.; *Holzinger* 291, Winona.

CAMASSIA LINDL. Bot. Reg. t. 1486 (—).

Cyanotris RAF. Am. Mo. Mag. (1819).

Sitocodium SALISB. Gen. Pl. Fragm. 27 (1822?).

Benth. and Hook., *Gen. Pl.* III, 815; Durand, *Ind. Gen. Phan.* 429; Engler and Prantl, *Nat. Pflanz.* 2, V, 66 (Engler).

Living species: 3; N. America; Canada, 3; Calif., 1; E. Sts., 1; S. Sts., 1; Pl. Wheel., 1; Pl. King, 1.

Camassia fraseri (NUTT.) TORR. Pac. Rep. IV, 147 (1856).

Phalangium esculentum NUTT. Fras. Cat. (1813).

P. fraseri NUTT.?

Scilla esculenta KER Bot. Reg. t. 1574 (1833).

S. fraseri GRAY. Man. ed. 5, 553 (1868).

Wats. and Coult., Gray's Man. 6 ed. 523; Mac., Fl. Can. II, 37; Upham, Fl. Minn. 147; Engl., Nat. Pflanz. 2, V, 66; Cov., Fl., Ark. 225.

North America: Ont. and W. Penn. to Ga.; W. to Minn., Kan. and Ark.

Minn. valley: Reported from S. central district; local and rare; wet prairies, bases of hills and banks of streams.

CLINTONIA RAF. Journ. Phys. LXXXIX, 102 (1819).

Xeniatrum SALISB. Gen. Pl. Fragm. 58 (1822?).

Benth. and Hook., *Gen. Pl.* III, 832; Durand, *Ind. Gen. Phan.* 432; Engler and Prantl, *Nat. Pflanz.* 2, V, 79 (Engler).

Living species: 6; Pac. America, 2; Atl. Amer., 2; Japan and E. Siberia, 1; C. and E. Himalayas, 1.

Clintonia borealis (AIT.) RAF. Atl. Journ. 120 (1832).

Dracaena borealis AIT. Hort. Kew. I, 5 (1789).

Smilacina borealis PURSH, Fl. Am. 232 (1814).

Convallaria umbellata TORR. Fl. N. Am. I, 355 (1824).

Wats. and Coult., Gray's Man. 6 ed. 527; Britt., Fl. N. J. 244; Upham, Fl. Minn. 145; Mac., Fl. Can. II, 47; Chap., Fl. S. St. 482; Engl., Nat. Pflanz. II, 5, 27.

North America: Labrador, Newf., N. S., N. Br., Q., Ont. to L. Winnipeg and the Saskatchewan; S. to N. J. and N. Car.; W. to Minn. and Oregon?.

Minn. valley: N. E. and N. W. districts; infrequent; cold woods and tamarack swamps.

HERB.: *Lugger* 1, Vermilion lake; *Roberts* 132, North shore; *Herrick* 309, St. Louis river; *Arthur* 46, Vermilion lake; *Bailey* 120, Vermilion lake; *Sandberg* 578, Agate bay.

UNIFOLIUM ADANS. Fam. II (1763).**Tovaria** NECK. Elem. III, 190 (1790) *not Adans.***Smilacina** DESF. Ann. Mus. Par. IX, 51 (1798).**Sigillaria** RAF. Jour. Phys. LXXXIX, 261 (1819).**Polygonastrum** MOENCH, Meth. 637 (1794).**Asteranthemum, Jocaste, Medora** KUNTH, Enum. V, 148-155 (1850).**Neolexis** SALISB. Gen. Pl. Fragm. 64 (1822?).**Majanthemum** WIGG. Prim. Holst. 15 (1780).**Sciophylla** WIBEL, Prim. Werth. 147 (1799).**Bifolium** GAERTN. Wett. Fl. I, 209 (1799).**Styrandra** RAF. Jour. Phys. LXXXIX, 102 (1819).**Maia** SALISB. Gen. Pl. Fragm. 64 (1822?).

Benth. and Hook., *Gen. Pl.* III, 770; Durand, *Ind. Gen. Phan.* 422; Engler and Prantl, *Nat. Pflanz.* 2, V, 79 (Engler); O. Kuntze, *Rev. Gen.* II, 717, 718; Schenck, *Palaeophyt.* 361.

Living species: 21; N. temperate regions, 2; Himalayas, 5; E. Siberia, 1; Japan, 1; W. N. America, 1 (end.); Mexico and Gautemala, 7; Canada, 6; California, 4; Rocky mts., 3; E. Sts., 4; N. America, 8-10; Europe, 1.

Fossil species: ?Cretaceous, Greenland (*Heer*); Tertiary, Greenland (*Heer*).

Unifolium bifolium (LINN.)*Convallaria bifolia* LINN. Spec. 316 (1753).*C. quadrifida* LAM. Fl. Fr. III, 269 (1778).*Majanthemum convallaria* WIGG. Prim. Fl. Holst. 15 (1780).*Evallaria bifolia* NECK. Elem. III, 196 (1791).*Convallaria tetrapetala* GILIB. Exerc. Phyt. II, 461 (1792).*Majanthemum cordifolium* MOENCH, Meth. 638 (1794).*Smilacina bifolia* DESF. Ann. Mus. IX, 54 (1807).*Majanthemum canadense* DESF. Ann. Mus. IX, 52 (1807).*Smilacina canadense* PURSH, Fl. Am. 233 (1814).*Styrandra bifolia* RAF. Jour. Phys. LXXXIX, 102 (1819).*Smilacina bifolia* var. *canadense* GRAY, Man. ed. 5, 530? (1868).*Unifolium canadense* GREENE, Torr. Bull. XV, 287 (1888).

Wats. and Coult., Gray's Man. 6 ed. 526; Britt., Fl. N. J. 241; Mac., Fl. Can. II, 32; Upham, Fl. Minn. 145; Chap., Fl. S. St. 481; Wats., Fl. Calif. II, 162; Richt., Pl. Eur. 231; Engl., Nat. Pflanz. II, 5, 80; Rothr., Alaska. 456.

Whole N. temperate zone.

North America: Labrador and Newf. to Hudson Bay, Bear lake and Rockies; S. through Can. to N. Eng., N. J. and N. Car. W. to Minn., Dak. and Iowa. Alaska.

Minn. valley: Throughout; principally in forest district and along streams; damp woods and banks; tamarack swamps.

HERB.: *Ballard* 870, Waconia; *Ballard* 418, New Prague, Scott Co.; *Ballard* 68, Chaska; *Taylor* 948, Glenwood;

Holzinger, 285, Winona Co.; *Sandberg* 582, Tower; *Oestlund* 200, Ramsey Co.; *Herrick* 312, Minneapolis; *Bailey* 246, Vermilion lake; *Kassube* 245, Minneapolis; *Hammond* 46, Lake City; *Herb. Sheld.* 1730, Minneapolis; 1710, Ramsey Co.

***Unifolium trifolium* (LINN.) GREENE,** Torr. Bull. XV, 287 (1888).

Convallaria trifolia LINN. Spec. 316 (1753).

Smilacina trifolia DESF. Ann. Mus. IX, 52 (1807).

Majanthemum trifolium LINK, Enum. I, 343 (1821).

Wats. and Coult., Gray's Man. 6 ed. 526; Britt., Fl. N. J. 241; Mac., Fl. Can. II, 32; Upham, Fl. Minn. 145; Engl., Nat. Pflanz. II, 5, 79.

E. Siberia.

North America: Labrador, Newf. to Man., Bear lake and Rocky mts.; S. to N. Eng., N. J. and Penn.; W. to Mich., Minn.

Minn. valley: Forest district and N. W. district; bogs and damp woods or darkly shaded banks.

HERB.: *Sheldon* 218, Lake Washington, Blue Earth Co.; *Roberts* 133, North shore; *Herrick* 311, St. Louis river; *Juni* 16, Put-in-Bay; *Bailey* 289, Vermilion lake; *Sandberg* 581, Chisago lake; *Herb. Sheld.* 1786, Minneapolis; *Hammond* 47, Lake City.

***Unifolium stellatum* (LINN.) GREENE,** Torr. Bull. XV, 287 (1888).

Convallaria stellata LINN. Spec. 316 (1753).

Smilacina stellata DESF. Ann. Mus. IX, 52 (1807).

Majanthemum stellatum LINK, Enum. I, 343 (1821).

Asteranthemum vulgare KUNTH, Enum. V, 152 (1850).

Wats. and Coult., Gray's Man. 6 ed. 526; Britt., Fl. N. J. 241; Webb, Fl. Neb. 108; Upham, Fl. Minn. 145; Mac., Fl. Can. II, 30; Coult., Fl. Colo. 350; Wats., Fl. Calif. II, 161; Richt., Pl. Eur. 231; Engl., Nat. Pflanz. II, 5, 79; Roth., Wheel. Exp. 270; Wats., King Exp. 345; Cov., Fl. Ark. 224; Hart., Fl. Scand. I, 569.

Introduced in Norway.

North America: Labrador to Hudson Bay, Saskatchewan, Assiniboia, Rocky mts. and Oregon; S. in Sierras to Carson, Nev.; in Rockies to N. Mex.; E. through Ark. and Neb. to Tenn., N. J. and Atl. coast.

Minn. valley: Throughout; frequent; banks, woods and moist copses.

HERB.: *Sheldon* 230, Lake Washington, Blue Earth Co.; *Sheldon* 135, Madison Lake; *Sheldon* 882, Sleepy Eye; *Sheldon* 12a, Elysian; *Ballard* 417, New Prague, Scott Co.; *Taylor* 166, Janesville; *Taylor* 212, Janesville; *Sandberg* 580, Goodhue Co.; *Herrick* 310, Minneapolis; *Holzinger* 284, Winona Co.; *Kassube*

244, Minneapolis; *Hammond* 44, Lake City; *Herb. Sheld.* 1895, Hennepin Co.; *Herb. Wickersheim* 125, Idlewild, Lincoln Co.; *Herb. Moyer* 239, Chippewa valley.

Unifolium racemosum (LINN.) BRITT. Torr. Bull. (1888).

Convallaria racemosa LINN. Spec. 315 (1753).

Smilacina racemosa DESF. Ann. Mus. IX, 52 (1807).

Smilacina ciliata PURSH, Fl. Am. 232 (1814).

Majanthemum racemosum LINK, Enum. I, 343 (1821).

Wats. and Coult., Gray's Man. 6 ed. 525; Britt., Fl. N. J. 240; Mac., Fl. Can. II, 31; Upham, Fl. Minn. 145; Chap., Fl. S. St. 481; Engl., Nat. Pflanz. II, 5, 79; Wats., King Exp. 345; Cov., Fl. Ark. 224.

North America: N. S., N. Br., Q., Ont. to Man. and Saskatchewan; S. to N. Eng., N. J. and S. Car.; W. to Minn., E. Kan. and Ark. S. to northern Mexico?

Minn. valley: Forest district, and probably throughout; moist woods and banks of streams and lakes.

HERB.: *Sheldon* 904, Sleepy Eye; *Ballard* 77, Chaska; *Sheldon* 136, Madison Lake, Blue Earth Co.; *Taylor* 12, Elysian; *Taylor* 135, Janesville; *Holzinger* 283, Winona Co.; *Kassube* 243, Minneapolis; *Sandberg* 579, Cannon Falls; *Hammond* 48, Lake City; *Herb. Sheld.* 1892, Minneapolis; *Herb. Wickersheim* 124, Mankato.

POLYGONATUM ADANS. Fam. II, 54 (1763).

Evallaria NECK. Elem. III, 189 (1790).

Axillaria RAF. Jour. Phys. LXXXIX, 261 (1819).

Campydorum SALISB. Gen. Pl. Fragm. 64 (1822?).

Periballanthus FRANCH. ET SAV. ex Dur. l. c. (1888).

Benth. and Hook., Gen. Pl. III, 768; Durand, Ind. Gen. Phan. 421; Engler and Prantl, Nat. Pflanz. 2, V, 80 (Engler); Schenck, Palaeophyt. 362.

Living species: 23; temperate N. hemisphere. Europe, 6; Russia, 7; Russian Europe, 4; N. America, 2-3; E. Sts., 2; Canada, 2; S. Sts., 2; Rocky mts., 1.

Polygonatum commutatum (SCHULT.) DIETR. Ott. Gartenz. 222 (1835).

Convallaria canaliculata WILLD. Spec. IV (1805).

? *Polygonatum canaliculatum* PURSH, Fl. Am. 235 (1814).

Convallaria commutata SCHULT. Syst. VII, 1671 (1830).

P. giganteum DIETR. Ott. Gartenz. 322 (1835).

Wats. and Coult., Gray's Man. 6 ed. 525; Britt., Fl. N. J. 240; Upham, Fl. Minn. 146; Webb., Fl. Neb. 108; Mac., Fl. Can. II. 28; Coult., Fl. Colo. 350; Wats., King Exp. 346; Cov., Fl. Ark. 224.

North America: W. Ont. to Saskatchewan; S. to N. Eng., N. J. and Va.; W. to Mont., Ark. and N. Mex.

Minn. valley: Throughout; common; woods and shady banks of lakes and streams.

HERB.: *Taylor 118a*, Janesville; *Ballard 67*, Chaska; *Sheldon 41*, Elysian; *Taylor 34*, Elysian; *Oestlund 201*, Hennepin Co.; *Holzinger 287*, Winona Co.; *Herrick 314*, Minneapolis; *Sandberg 584*, Cannon Falls; *Hammond 45*, Lake City; *Herb. Wickersheim 126*, Lake Benton.

Polygonatum biflorum (WALT.) ELL Sk. (1823).

Convallaria biflora WALT. Fl. Car. 122 (1788).

C. multiflora MICHX. Fl. I, 202 (1803).

Polygonatum angustifolium, ? *canaliculatum*, *pubescens*, ? *hirtum*, *latifolium* and *multiflorum* PURSH, Fl. I, 234-235 (1814).

Convallaria parviflora POIR. Suppl. Enc. Meth. IV, 29 (1816).

Wats. and Coult., Gray's Man. 6 ed. 525; Britt., Fl. N. J. 240; Mac., Fl. Can. II, 28; Chap., Fl. S. St. 481; Upham, Fl. Minn. 146; Engl., Nat. Pflanz. II, 5, 81; Cov., Fl. Ark. 224; Webb., Appx. Neb. 26.

North America: N. S., N. Br., Q., Ont. to Owen Sound, Georgian Bay and S. Man.; S. to N. Eng., N. J. and Fla.; W. to Minn., Neb., E. Kan., Ark. and Tex.

Minn. valley: Throughout; frequent; woods and shady banks of lakes and streams.

HERB.: *Taylor 262*, Janesville; *Sheldon 116*, Madison Lake, Blue Earth Co.; *Ballard 69*, Chaska; *Holzinger 286*, Winona Co.; *Herrick 313*, Minneapolis; *Kassube 246*, Minneapolis; *Sandberg 583*, Cannon Falls; *Hammond, 43*, Lake City; *Herb. Moyer 240*, Carlton lake, near Montevideo.

MEDEOLA LINN. Gen. 305 (1737).

Gyromia NUTT Gen. I, 238 (1818).

Benth. and Hook., *Gen. Pl.* III, 833; Durand, *Ind. Gen. Phan.* 432; Engler and Prantl, *Nat. Pflanz.* 2, V, 83 (Engler).

Living species: 1; Atlantic N. America.

Medeola virginiana LINN. Spec. 339 (1753).

M. virginica LINN. Spec. ed. 2 (1762).

Gyromia virginica NUTT. Gen. I, 238 (1818).

Wats. and Coult., Gray's Man. 6 ed. 530; Britt., Fl. N. J. 244; Upham, Fl. Minn. 144; Mac., Fl. Can. II, 48; Chap., Fl. S. St. 479; Engl., Nat. Pflanz. II, 5, 83; Cov., Fl. Ark. 225.

North America: N. S., N. Br., Q., Ont. to Owen Sound and Georgian Bay; S. to N. Eng., N. J., Mid. Fla.; W. to Minn., Ind. and Ark.

Minn valley: Reported from N. E. district; rare; rich woodland and banks of streams.

TRILLIUM LINN. Gen. ed. V, 412 (1754).

Delostylis RAF. Journ. Phys. LXXXIX, 102 (1819).

Trillidium KUNTII, Enum. V, 120 (1850).

Esdra SALISB. Gen. Pl. Fragm. 60 (1822?).

Benth. and Hook., *Gen. Pl.* III, 833; Durand, *Ind. Gen. Phan.* 432; Engler and Prantl, *Nat. Pflanz.* 2, V, 84 (Engler).

Living species: 15; N. America and from Japan to the Himalayas. N. America, 14; Canada, 5-6; S. Sts., 8-10; E. Sts., 7; California, 4-5.

Trillium nivale RIDD. Syn. W. Fl. 93 (1835).

Wats. and Coult., Gray's Man. 6 ed. 531; Upham, Fl. Minn. 144.

North America: W. Penn. to Ky., Ohio, Iowa and Minnesota.

Minn. valley: S. central district; local and rare; rich woods and shaded banks.

HERB.: *Leiberg* 73, Blue Earth Co.

Trillium cernuum LINN. Spec. 339 (1753).

T. pendulum MUHL. Willd. Hort. Berol. I, 35 (1816).

Wats. and Coult., Gray's Man. 6 ed. 531; Britt., Fl. N. J. 245; Upham, Fl. Minn. 144; Mac, Fl. Can. II, 50; Chap., Fl. S. St. 478.

North America: Newf., N. S., Q., Ont., Georgian Bay; S. to N. Eng., N. J., Ga.; W. to Minn. and Mo.

Minn. valley: Throughout; frequent; woods and along streams.

HERB.: *Sheldon* 202, Lake Washington, Blue Earth Co.; *Taylor* 918, Glenwood; *Kassube* 239, Minneapolis; *Sandberg* 570, Taylor's Falls; *Leonard* 46, Bloomington; *Herb. Wickersheim* 122, Lake Benton; *Herb. Moyer* 236, Montevideo.

Trillium grandiflorum (MICHX.) SALISB. Parad. Lond. I, (1806).

T. rhomboideus var. *grandiflorum* MICHX. Fl. N. Am. I, 216 (1803).

T. camtschaticum PURSH. Fl. Am. I, 246 (1814).

Wats. and Coult., Gray's Man. 6 ed. 530; Upham, Fl. Minn. 144; Mac., Fl. Can. II, 50; Chap., Fl. S. St. 478; Engl., Nat. Pflanz. II, 5, 84.

Ont. to Owen Sound; E. to Vt.; S. to N. Car.; W. to Minn. and Mo.

Minn valley: Forest district and probably N. W.; rich woodland and shaded river banks.

HERB.: *Hammond* 3, Lake City; *Holzinger* 281, Winona; *Sandberg* 569, Vasa.

Trillium erectum LINN. Spec. 340 (1753).

T. album PURSH, Fl. Am. I, 245 (1814).

T. pendulum AIT. Hort. Kew. ed. 2, II, 328 (1811).

T. erectum var. *declinatum* GRAY, Man. ed. 5. 523 (1868).

Wats. and Coult., Gray's Man. 6 ed. 530; Britt., Fl. N. J. 245; Upham, Fl. Minn. 144; Chap., Fl. S. St. 478; Mac., Fl. Can. II, 48; Engl., Nat. Pflanz. II, 5, 84.

North America: N. S., Q., Ont., Man.; S. to N. J. and N. Car.; W. to Minn. and Mo.

Minn. valley: Forest district; rich woodland and shaded riverbanks.

HERB.: *Taylor* 120, Janesville; *Ballard* 202, Jordan, Scott Co.; *Sandberg* 566, Chisago lake; var. *album* (Pursh) = *Sandberg* 567, Red Wing; *Sandberg* 568, Red Wing; var. *declinatum* Gray = *Holzinger* 280, Winona; *Herrick* 302, Minneapolis; *Arthur* 103, Vermilion lake; *Herrick* 303, St. Louis river; *Bailey* 231, Vermilion lake.

Trillium recurvatum BECK, Bot. (1833).

Wats. and Coult., Gray's Man. 6 ed. 530; Upham, Fl. Minn. 144.

North America: Ohio and Ind. to Ill. Minn., Mo. and Ark.

Minn. valley: Reported from Rice Co.; doubtful or rare.

Trillium sessile LINN. Spec. (1753).

Wats. and Coult., Gray's Man. 6 ed. 530; Upham, Fl. Minn. 144; Chap., Fl. S. St. 477; Cov., Fl. Ark. 225.

North America: Penn. to Fla.; W. to Minn. and Ark.

Minn. valley: Reported from N. E. district; rare or doubtful; damp woods and shaded banks.

SMILAX LINN. Gen. 751 (1737).

Nemexia RAF. Med. Fl. II, 264 (1830).

Coprosmanthus KUNTH, Enum. V, 263 (1850).

Parillax RAF. Med. Fl. l. c. (1830).

Pleiosmilax SEEM. Jour. Bot. 193 (1868).

Benth. and Hook., *Gen. Pl.* III. 763; Durand, *Ind. Gen. Phan.* 420; Engler and Prantl, *Nat. Pflanz.* 2, V, 88 (Engler); Schenck, *Palaeophyt.* 362, 363.

Living species: 200±; especially in the tropics, but extending to temperate N. America, E. Asia and the Mediterranean region. Europe, 3; Russia, 2; N. America, 14; E. Sts., 12; California, 1; Canada, 3; S. Sts., 10; Rocky mts., 1.

Fossil species: A large number described, but many doubtful. Tertiary—Eocene and Miocene. Greenland (*Heer*); S. France (*Saporta*); W. America (*Lesquereaux*); Baltic region, amber (*Conwentz*).

Smilax hispida MUHL. Cat. 97 (1813).

? *S. rotundifolia* WILLD. Spec. IV, 779 (1805).

S. grandifolia BUCKL. in Herb. Boiss.

Wats. and Coult., Gray's Man. 6 ed. 521; Britt., Fl. N. J. 239; Webb., Fl. Neb. 108; Mac., Fl. Can. II, 27; Upham, Fl. Minn. 143.

North America: Ont. to Conn., N. J. and Va.; W. to Minn., Neb. and Tex.

Minn. valley: Forest district; thickets and edges of woods; rather rare.

HERB.: *Sandberg 564*, Cannon Falls.

Smilax rotundifolia LINN. Spec. 1460 (1753).

S. caduca LINN. Herb. Kalm.

S. quadrangularis MUHL. Willd. Spec. IV, 775 (1805).

S. ciliata STEUD. Hort. Frank.

S. aspera DC. Organ. II, 262 (1827).

Wats. and Coult., Gray's Man. 6 ed. 520; Britt., Fl. N. J. 239; Chap., Fl. S. St. 477; Upham, Fl. Minn. 143; Mac., Fl. Can. II, 26; Coult., Fl. Colo. 355; Engl., Nat. Pflanz. II, 5, 89; Cov. Fl. Ark. 224.

Central America; W. Indies.

North America: Ont. to N. Eng., N. J. and Ga.; W. to Minn., Colo., Mo., Ark. and Tex.

Minn. valley: Forest district and probably throughout; woods along streams.

HERB.: *Ballard 87n*, Chaska; *Sheldon 39*, Elysian; *Taylor 200*, Janesville; *Taylor 487*, Janesville; *Taylor 45*, Elysian; *Taylor 664*, Cobb river, Blue Earth Co.; *Sandberg 563*, Cannon Falls.

Smilax echirrata WATS. Gray's Man. ed. 6, 520 (1890).

Wats. and Coult., Gray's Man. 6 ed. 520.

North America: Md. to S. Car.; W. to Mich., Minn., Mo. and Ark.

Minn. valley: S. E. district: moist, wooded banks and damp thickets,

HERB.: *Taylor 709*, Minnesota lake.

Smilax herbacea LINN. Spec. 1030 (1753).

? *S. pulverulenta* MICHX. Fl. II, 238 (1803).

? *S. peduncularis* MUHL. Willd. Spec. IV, 786 (1805).

Coprosmanthus herbaceus KUNTH, Enum. V, 264 (1850).

Smilax herbacea var. *pulverulenta* GRAY, Man. 5 ed. (1868).

Wats. and Coult., Gray's Man. 6 ed. 520; Britt., Fl. N. J. 239; Webb., Fl. Neb. 108; Upham, Fl. Minn. 143; Mac., Fl. Can. II, 27; Engl., Nat. Pflanz. II, 5, 88; Cov. Fl. Ark. 224; Webb., Appx. Neb. 26.

Japan.

North America: N. Br. to Winnipeg, Red, Saskatchewan and Assiniboine valleys; S. to N. Eng., N. J., Fla.; W. to Minn., Neb., Mo. and Tex.

Minn. valley: Throughout; abundant; meadows and river banks.

HERB.: *Taylor* 945, Glenwood; *Sheldon* 311, Madison Lake, Blue Earth Co.; *Taylor* 819, Glenwood; *Taylor* 199, Janesville; *Taylor* 710, Minnesota lake; *Taylor* 30, Elysian; *Sheldon* 700, Waseca; *Kassube* 238, Minneapolis; *Juni* 15, Minneapolis; *Sandberg* 565, Red Wing; and in var. *puverulenta* (Michx.); *Sheldon* 212½, Lake Washington, Blue Earth Co.; *Sheldon* 382, Madison Lake, Blue Earth Co.; *Herb. Sheld.* 1891, Minneapolis; *Herb. Wickersheim* 120, Mankato; *Herb. Wickersheim* 121, Idlewild, Lincoln Co.; *Herb. Moyer* 235, var. *puverulenta* (Michx.), Montevideo.

XVIII. AMARYLLIDACEAE. Amaryllis Family.

Endlicher, *Gen. Pl.* 147 (1840); Benth. and Hook., *Gen. Pl.* III, 711 (1883); Pax, in *Engler and Prantl, Nat. Pflanz.* 2, V, 97 (1887).

Genera: 70; temperate and warmer regions.

Species: 700; principally subtropical.

HYPOXIS LINN. *Gen. ed.* VI, 417 (1764)

Janthe, Spiloxene SALISB. *Gen. Pl. Fragm.* 44 (1822?).

Niobe WILLD. *Rel. Schult. Syst.* VII, 762 (1830).

Benth. and Hook., *Gen. Pl.* III, 717; Durand, *Ind. Gen. Phan.* 415; Engler and Prantl, *Nat. Pflanz.* 2, V, 121 (Pax).

Living species: 50; tropical regions; Australia; N. America; S. Africa and Mascarene Isls. N. America, 2; Rocky mts., 1; E. Sts., 2; S. Sts., 2.

Hypoxis erecta LINN. *Spec. ed.* 2, 439 (1762).

H. carolinensis MICHX. *Fl. N. Am.* I, 188 (1803).

Wats. and Coult., *Gray's Man.* 6 ed. 517; Britt., *Fl. N. J.* 238; Upham, *Fl. Minn.* 142; Mac., *Fl. Can.* II. 26; Webb., *Fl. Neb.* 108; Chap., *Fl. S. St.* 468; Cov. *Fl. Ark.* 223.

North America: Prairie region of Can. from Assiniboia to Ont.; S. to N. Eng., N. J. and Fla.; W. to Minn., Neb., E. Kan. and Tex.

Minn. valley: Throughout; meadows and hillsides.

HERB.: *Taylor* 347, Janesville; *Ballard* 277, Jordan, Scott Co.; *Herrick* 300, Minneapolis; *Kassube* 235, Minneapolis; *Sandberg* 560, Cannon Falls; *Hammond* 40, Lake City; *Herb. Sheld.* 1841, Minneapolis; *Herb. Wickersheim* 119, Idlewild, Lincoln Co.; *Herb. Moyer* 232, Black Oak lake, Chippewa Co.

XIX. DIOSCOREACEAE. Yam Family.

Endlicher, *Gen. Pl.* 157 (1840); Benth. and Hook., *Gen. Pl.* III, 741 (1883); Pax, in *Engler and Prantl, Nat. Pflanz.* 2, V, 131 (1887).

Genera: 9 living; 2 extinct. Warmer regions.

Species: 175±; 5-6 extinct.

DIOSCOREA LINN. Gen. 754 (1737).**Borderea** MIEGEV. Bull. Soc. Fr. XIII, 374 (1867).**Epipetrum** PHILIPPI, Linn. XXXIII, 253 (1859).**Helmia** KUNTH, Enum. V, 414 (1850).**Hamatris** SALISB. Gen. Pl. Fragm. 11 (1822?).**Botryosyehios** HOCHST. Flora (1844).**Merione** and **Polynome** SALISB. l. c. (1822?).**Sismondea** DELPON. Mem. Tur. 2, XIV, 394 (1854).**Strophis** and **Elephantodon** SALISB. l. c. 12 (1822?).Benth. and Hook., *Gen. Pl.* III, 743; Durand, *Ind. Gen. Phan.* 420; Engler and Prantl, *Nat. Pflanz.* 2, V, 132 (Pax); Schenck, *Palaeophyt.* 365.

Living species: 150; warmer regions of the earth. Principally N. and S. America and S. Africa. U. S., 1.

Fossil species. Cretaceous, Kansas (*Lesquereaux*), a doubtful species. Tertiary, S. France, Bonn, 1-2 (*Saporta*, *Weber*).**Dioscorea villosa** LINN. Spec. 1033 (1753).*D. quinata* WALT. Fl. Car. 246 (1788).*D. paniculata* MICHX. Fl. N. Am. II, 239 (1803).

Wats. and Coult., Gray's Man. 517; Britt., Fl. N. J. 238; Upham, Fl. Minn. 143; Chap., Fl. S. St. 474; Mac., Fl. Can. II, 26; Engl. Pax, Nat. Pflanz. II, 5, 134; Cov., Fl. Ark. 224.

North America: Ont. to N. Eng., N. J. and Fla.; W. to Minn., Kan., Ark. and Tex.

Minn. valley: Forest district; Ft. Snelling to Mankato; infrequent; thickets and edges of woods.

XX. IRIDACEAE. Iris Family.Endlicher, *Gen. Pl.* 164 (1840); Benth. and Hook., *Gen. Pl.* III, 681 (1883); Pax in Engler and Prantl, *Nat. Pflanz.* 2, V, 137 (1887).*Genera*: 57 living; 1 fossil.*Species*: 800; Mediterranean and African region, and all warmer and temperate regions. Center in Cape of Good-hope region for Old World, and in Central America for New World.**IRIS** LINN. Gen. 29 (1737).**Neubeckia** ALEF. Bot. Zeit. 290, 297 (1863).**Chamoletta** ADANS. Fam. II, 60 (1763).**Xyridion** and **Ioniris** KLATT. Bot. Zeit. 497, 513 (1872).**Onocyclus** SIEMSS. Bot. Zeit. 706 (1846).**Evansia**, **Diaphane**, **Thelysia** SALISB. Trans. Hort. Soc. I, 303-305 (1812).**Costia** WILLK. Bot. Zeit. 131 (1860).**Coresanthe** ALEF. Bot. Zeit. 298 (1863).**Hermodactylon**, **Xiphion**, **Gynandiris** PARLAT. N. Gen. et Spec. Monoc. 34 (1839?).

Juno TRATT. R. and S. Syst. I, 471, 474 (1817).

Benth. and Hook., *Gen. Pl.* III, 686; Durand, *Ind. Gen. Phan.* 412; Engler and Prantl, *Nat. Pflanz.* 2, V, 145 (Pax); Schenck, *Palaeophyt.* 364.

Living species: 100; temperate and warmer N. hemisphere; Russia, 38; Europe, 41; Russian Europe, 14; N. America, 20; California, 6; S. Sts., 7; Rocky mts., 2; E. Sts., 6; Canada, 6-7; Pl. King, 1; Pl. Wheel., 1.

Fossil species: Tertiary, Oeningen (*Heer*); Greenland, Spitzbergen, Grinnell-Land—*Iridium* (*Heer*).

Iris versicolor LINN. Spec. 39 (1753).

? *I. hexagona* WALT. Fl. Car. 66 (1788).

I. virginica PURSH, Fl. Am. 29 (1814).

Wats. and Coult., Gray's Man. 6 ed. 513; Britt., Fl. N. J. 237; Mac., Fl. Can. II, 23; Upham, Fl. Minn. 143; Chap., Fl. S. St. 472; Cov., Fl. Ark. 223; Webb., Appx. Neb. 26.

North America: Newf., N. S., Q., Ont. to Man.; S. to N. J., Fla.; W. to Minn., Neb. and Ark.

Minn. valley: Throughout; abundant; marshes and swamps; wet meadows and edges of streams.

HERB.: *Ballard* 57, Chaska; *Sheldon* 367, Madison Lake, Blue Earth Co.; *Taylor* 299, Janesville; *Sheldon* 12, Elysian; *Kassube* 236, Minneapolis; *Oestlund* 197, Hennepin Co.; *Holzinger* 279, Winona Co.; *Bailey* 220, Vermilion lake; *Sandberg* 561, Goodhue Co.; *Hammond* 41, Lake City; *Herb. Moyer* 233, Montevideo.

SISYRINCHIUM LINN. Gen. 689 (1737).

Souza VELLOZ. Fl. Flum. 273 (1827).

Syrorhynchium HOFFM. ex Durand, l. c. (1888).

Bermudiana ADANS. Fam. II, 60 (1763).

Echthronema, **Glumosa**, **Eriphilema** HERB. Bot. Reg.

Hydastylus SALISB. Trans. Hort. Soc. I, 310 (1812).

Benth. and Hook., *Gen. Pl.* III, 698; Durand, *Ind. Gen. Phan.* 413; Engler and Prantl, *Nat. Pflanz.* 2, V, 150 (Pax).

Living species: 50; America, especially tropics; extending to Canada and Magellan. N. America, 6-8; California, 3-4; Canada, 4; E. Sts., 3; S. Sts., 2-3.

Sisyrrinchium mucronatum MICHX. Fl. N. Am. II, 33 (1803).

S. angustifolium AUCT. (*in part.*)

Wats. and Coult., Gray's Man. 6 ed. 515; Britt., Fl. N. J. 238; Webb., Fl. Neb. 108; Chap., Fl. S. St. 474; Coult., Fl. Colo. 345; Mac., Fl. Can. II, 25; Upham, Fl. Minn. 143; Roth., Wheel. Exp. 266; Cov., Fl. Ark. 223.

North America: Ranges with *S. angustifolium* Mill.

Minn. valley: N. E. and N. districts; infrequent; habitat like that of *S. angustifolium* Mill.

HERB.: *Bailey* 493, Agate bay; *Bailey* 435, Basswood lake.

***Sisyrinchium angustifolium* MILL.** Dict. (1768).

? *S. gramineum* LAM. Enc. Meth. I, 403 (1783).

S. anceps CAV. Diss. VI, 345 (1790).

S. bermudiana MICHX. Fl. N. Am. II, 33 (1803) *in part*.

Wats. and Coult., Gray's Man. 6 ed. 515; Britt., Fl. N. J. 238; Upham, Fl. Minn. 143; Mac., Fl. Can. II, 25; Chap., Fl. S. St. 474; Coult., Fl. Colo. 345; Richt., Pl. Eur. 259; Hook., Fl. Gt. Brit. 396; Nym., Fl. Eur.; Led., Fl. Ross. IV, 92; Wats., King Exp. 342; Cov., Fl. Ark. 223; Rothr., Alask. 456.

Introduced? in Ireland and N. Germany.

North America: Throughout, except Pac. coast region.

Minn. valley: Throughout; abundant; prairies, fields and grassy slopes.

HERB.: *Taylor* 175, Janesville; *Taylor* 545, Janesville; *Leonard* 45, Minneapolis; *Herrick* 301, Minneapolis; *Kassube* 237, Minneapolis; *Kassube* 238, Minneapolis; *Sandberg* 562, Red Wing; *Herb. Sheld.* 1840, Minneapolis; *Herb. Moyer* 234, Montevideo.

XXI. ORCHIDACEAE. Orchis Family.

Endlicher, *Gen. Pl.* 185 (1840); Benth. and Hook., *Gen. Pl.* III, 460 (1883); Pfitzer in *Engler and Prantl, Nat. Pflanz.* 2, VI, 52 (1888).

Genera: 350-400; cosmopolitan; principally tropical; very few subpolar; abundant in mt. districts, especially in the Himalayas.

Species: 10,000; 5000 (Benth. and Hook.); a great number are epiphytic.

CYPRIPEDILUM LINN. Gen. 687 (1737) em. Pftz. (1888).

***Criosanthes* RAF.** Jour. Phys. LXXXIX, 102 (1819).

***Arietinum* BECK,** Bot. 352 (1833).

Benth. and Hook., *Gen. Pl.* III, 634; Durand, *Ind. Gen. Phan.* 404; Engler and Prantl, *Nat. Pflanz.* 2, VI, 82 (Pfitzer).

Living species: 20-25; temperate N. hemisphere to Japan, N. India and Mexico; also Peru? N. America, 10-15; Canada, 8; S. Sts., 4; California, 2-3; E. Sts., 6; Rocky mts., 2.

***Cypripedium acaule* AIT.** Hort. Kew. III, 161 (1789).

C. humile SALISB. Linn. Trans. I, 78 (1791).

Wats. and Coult., Gray's Man. 511; Britt., Fl. N. J. 236; Mac., Fl. Can. II, 22; Upham, Fl. Minn. 142; Chap., Fl. S. St. 464; Engl. Pfitzer, *Nat. Pflanz.* II, 6, 83.

North America: Newf. to Ft. Franklin and throughout E. Can.; S. to N. J. and N. Car.; W. to N. Ind., Mich. and Minn.

Minn. valley: N. E. and N. W. districts; tamarack swamps and swampy forest.

HERB.: *Taylor* 1103, Glenwood; *Gedge* 15, Detroit lake; *Sheldon* 1620, Lake Calhoun; *Sandberg* 559, Center City; *Herb. Sheld.* 1641, Hennepin Co.

***Cypripedium spectabile* Sw. Act. Holm. (1800)?**

C. calceolus var. *g* LINN. Spec. 1346 (1762).

C. hirsutum MILL. Dict. ed. 8 (1768).

C. reginae WALT. Fl. Car. 222 (1788).

C. album AIT. Hort. Kew. III, 303 (1789).

C. canadense MICHX. Fl. N. Am. II, 161, (1803).

Wats. and Coult., Gray's Man. 6 ed. 511; Britt., Fl. N. J. 236; Upham, Fl. Minn. 142; Chap., Fl. S. St. 464; Mac., Fl. Can. II, 21; Engl. Pfitzer, Nat. Pflanz. II, 6, 83.

North America: N. S., N. Br., Q., Ont., to Georgian Bay; S. to Maine, W. N. Eng., N. J. and mts. of N. Car.; W. to Minn., Mo. and Ark.

Minn. valley: Forest district and probably sparingly throughout; woods and bogs; tamarack swamps.

HERB.: *Sheldon* 616, Wilton, Waseca Co.; *Herrick* 298, Minneapolis; *Kassube* 234, Minneapolis; *Ballard* 1004, Zumbrota; *Herrick* 299, Minneapolis; *Oestlund* 195, Ramsey Co.; *Oestlund* 196, Ramsey Co.; *Holzinger* 277, 278, Winona Co.; *Sandberg* 558, Cannon Falls; *Hammond* 38, Lake City.

***Cypripedium pubescens* WILLD. Hort. Berol. I, 13 (1816).**

C. calceolus WALT. Fl. Car. 221 (1788).

Wats. and Coult., Gray's Man. 6 ed. 511; Upham, Fl. Minn. 142; Britt., Fl. N. J. 236; Webb., Fl. Neb. 109; Coult., Fl. Colo. 344; Chap., Fl. S. St. 464; Mac., Fl. Can. II, 21; Engl. Pfitzer, Nat. Pflanz. II, 6, 81.

North America: N. S., N. Br., Q., Ont. to Georgian Bay and Lake Winnepegoosis; Saskatchewan to the Rockies; S. to N. J., Va., and W. to Minn., Kan., Neb., Colo. and Ark.

Minn. valley: Forest district; woods and swamps, perhaps westward.

HERB.: *Taylor* 114, Janesville; *Sandberg* 556, Goodhue Co.; *Kassube* 233, Minneapolis; *Sandberg* 557, Red Wing; *Herb. Sheld.* 1694, Minneapolis; *Herb. Wickersheim* 118, Mankato.

***Cypripedium parviflorum* SALISB. Linn. Trans. I, 77 (1791).**

C. calceolus MICHX. Fl. N. Am. II, 161 (1803).

Wats. and Coult., Gray's Man. 6 ed. 511; Britt., Fl. N. J. 236; Mac., Fl. Can. II, 20; Chap., Fl. S. St. 464; Coult., Fl. Colo. 344; Upham, Fl. Minn. 142; Mac., Fl. Can. II, 364; Cov., Fl. Ark. 223.

North America: Newf., Anticosti, Q., Ont. to Man. and Saskatchewan; S. to N. J. and Ga.; W. to Minn., Wyoming, Kan., Ark.; Brit. Col. at 3000 ft. alt. ;

Minn. valley: Forest district; to Kasota; N. E. and N. districts; bogs and damp woodland.

HERB.: *Ballard* 16, Chaska; *Kassube* 232, Minneapolis; *Holzinger* 275, Winona Co.; *Ballard* 1003, Zumbrota; *Holzinger* 276, Winona Co.; *Hammond* 39, Lake City; *Herb. Sheld.* 1642, Lake Calhoun, Hennepin Co.; 1676, Minneapolis; 1901, Ramsey Co.

Cypripedium candidum MUHL. Willd. Spec. IV, 142 (1805).

Wats. and Coult., Gray's Man. 6 ed. 510; Britt., Fl. N. J. 236; Webb., Fl. Neb. 109; Upham, Fl. Minn. 142.

North America: N. Y., N. J., Penn. to Minn., Neb., Mo., Ky.

Minn. valley: Forest district and W. to Pomme des Terre valley; local or infrequent; bogs and wet woods.

HERB.: *Leiberg* 72, Blue Earth Co.; *Kassube* 231, Minneapolis; *Sandberg* 555, Cannon Falls; *Herb. Sheld.* 1902, Ramsey Co.; *Herb. Moyer* 231, Sparta township, Chippewa Co.

Cypripedium arietenum R. BR. Hort. Kew. V, 222 (1813).

Cryosanthus borealis RAF. Jour. Phys. LXXXIX, 102 (1819).

Arietinum americanum BECK, Bot. 352 (1833).

Wats. and Coult., Gray's Man. 6 ed. 510; Upham, Fl. Minn. 142; Mac., Fl. Can. II, 20; Engl. Pfitzer, Nat. Pflanz. II, 6, 83.

North America: Q., Ont. to Saskatchewan; S. to Maine, N. N. Y., Mich. and Minn.

Minn. valley: N. W. district and N. edge; infrequent or local; swamps and wet forests.

HERB.: *Taylor* 1122, Glenwood; *Gedge* 14, Riverton.

ORCHIS LINN. Gen. 681 (1737) p. p.

Traunsteinera REICHB. Fl. Sax. 87 (1842).

Strateuma SALISB. Trans. Hort. Soc. I, 290 (1812).

Barlia PARLAT. Fl. It. III, 445 (1862?).

Loroglossum L. C. RICH. Mem. Mus. Par. IV, 47 (1808).

Himantoglossum SPRENG. Syst. III, 675 (1826).

Comperia C. KOCH, Linn. XXII, 287 (1848).

Anacamptis L. C. RICH. Mem. Mus. Par. IV, 47 (1808).

Aceras R. BR. Ait. Hort. Kew. ed. 2, V, 191 (1813).

Benth. and Hook., Gen. Pl. III, 620, 621; Durand, Ind. Gen. Phan. 402; Engler and Prantl, Nat. Pflanz. 2, VI, 88, 89, 90 (Pfitzer); Schenck, Palaeophyt. 388.

Living species: 75-80; Europe; temperate Asia; N. Africa; Canaries; N. America. Europe, 75; N. America, 3; Canaries, 2; Russia, 25; Russian Europe, 25; Atl. N. America: Canada, 3; E. Sts., 2; S. Sts., 1.

Fossils: 2 genera of Orchidaceae are described by Massalonga from Eocene of Mt. Bolca.

Orchis spectabilis LINN. Spec. 943 (1753).*O. humilis* MICHX. Fl. N. Am. II, 155 (1803).*Habenaria spectabilis* SPRENG. Syst. II, 689 (1825).

Wats. and Coult., Gray's Man. 6 ed. 506; Britt., Fl. N. J. 223; Mac., Fl. Can. II, 12; Chap., Fl. S. St. 458; Webb., Fl. Neb. 109; Upham, Fl. Minn. 139; Cov., Fl. Ark. 222.

North America: N. Br., Ont. to N. Eng., N. J. and Ga.; W. to Minn., Dak., Neb., Mo. and Ark.

Minn. valley: Forest and N. W. districts; damp woods and shaded banks.

HERB.: *Taylor* 217, Janesville; *Sheldon* 567, Waseca; *Taylor* 1166, Glenwood; *Leiberg* 66, Blue Earth Co.; *Leiberg* 67, Blue Earth Co.; *Herb. Sheld.* 1681, Prospect Park, Hennepin Co.

HABENARIA WILLD. Spec. IV, 44 (1805).*Sieberia* SPRENG. Anleit K. Gew. II, 282 (1802).*Gymnadenia* R. BR. Hort. Kew. ed. 2, V, 191 (1813).*Nigritella* L. C. RICH. Ann. Mus. Par. IV, 48 (1808).*Tinea* BIVON. Giorn. Sci. Sic. 149 (1833).*Neotinea* REICH. f. Poll. Orch. Comm. 149 (1864).*Leucorchis* E. MEY. Preuss. Gatt, 50 (1839).*Bicchia* PARLAT. Fl. It. III, 396 (1862?).*Perularia* LINDL. Bot. Reg. t. 1701 (1835).*Deroemeria* REICH. f. Poll. Orch. Comm. 29 (1864).*Peristylis* BLUME, Bij. 404 (1826).*Gennaria* PARLAT. Fl. It. III, 404 (1862?).*Benthamia* A. RICH. Orch. Fr. Bourb. 43 (1828).*Cybele* FALC. Lindl. Veg. Kingd. 183c (1846).*Coeloglossum* HART. Scand. Fl. ed. IV, 283 (1842?).*Lindblomia* FRIES, Lindl. Bot. Not. 131 (1843).*Chaeradoplectron* SCHAUER, Pl. Mey. 436 (1835).*Platanthera* L. C. RICH. Ann. Mus. Par. IV, 48 (1808).*Lysias* SALISB. Trans. Hort. Soc. I, 288 (1812).*Mecosa* BLUME, Bij. 403 (1826).*Centrochilus* SCHAUER, Pl. Mey. 435 (1835).*Mitostigma* BLUME, Mus. Lugd.-Bat. II, 189 (1856).*Ponerorchis* REICH. f. Linn. XXV, 227 (1851).*Dissorhyncium* SCHAUER, Pl. Meyen. 434 (1835).*Bilabrella* LINDL. Bot. Reg. 1701 (1835).*Ate* LINDL. Gen. and Spec. Orch. 326 (1839).*Barlaea* REICH. f. Linn. XLI, 54 (1867).*Macrocentrum* PHILLIPS, Sert. Mendoc. II, 42 (—).*Synmeria* GRAH. Cat. Pl. Bomb. Add. (1839).*Montolivaea* REICH. f. Ot. Hamb. 107 (1879).*Roeperocharis* REICH. f. l. c. 104 (1879).

Benth. and Hook., *Gen. Pl.* III, 625; Durand, *Ind. Gen. Phan.* 403; Engler and Prantl, *Nat. Pflanz.* 2, VI, 91, seq. (Pfitzer).

Living species: 450-500; temperate and warmer regions; especially tropical Asia and America. Europe, 24; North America, 35-40; Canada, 23; E. Sts., 18-20; S. Sts., 17; California, 10-12; Rocky mts., 5; Pl. King., 3; Pl. Wheel., 3.

Habenaria psycodes (LINN.) GRAY.

Orchis psycodes LINN. Spec. 493 (1753).

O. fimbriata AIT. Hort. Kew. III, 297 (1789).

O. incisa and *fissa* MUHL. Willd. Spec. IV, 40 (1805).

Habenaria fimbriata R. BR. Hort. Kew. ed. 2, V, 193 (1813).

Orchis grandiflora BIGEL. Fl. Bost. 321 (1814).

Habenaria racemosa RAF. Ann. Nat. 15 (1820).

H. incisa and *fissa* TORR. Compend. 319 (1826).

H. grandiflora TORR. Compend. 319 (1826).

Platanthera fimbriata LINDL. Orch. 293 (1839).

Wats. and Coult., Gray's Man. 6 ed. 509; Britt., Fl. N. J. 235; Upham, Fl. Minn. 140; Mac., Fl. Can. II, 19; Chap., Fl. S. St. 460; Mac., Can. Fl. II, 363; Cov., Fl. Ark. 222.

North America: Newf., N. S., Anticosti to Lake Huron, Georgian Bay, Kaministiquia river and S. W. Man.; S. to N. J., N. Car.; W. to Minn., Ind. and Ark.

Minn. valley: Throughout forest and N. districts; cool bogs or tamarack swamps and sphagnum marshes.

HERB.: *Bailey* 429, Fall lake; *Oestlund* 192, Minnehaha; *Roberts* 128, Knife river; *Holzinger* 273, Winona Co.

Habenaria lacera (MICHX.) R. BR. Hort. Kew. ed. II, V, 193 (1813).

Orchis lacera MICHX. Fl. N. Am. II, 156 (1803).

O. psycodes MUHL. Willd. Spec. IV, 39 (1805).

Habenaria psycodes TORR. Compend. 317 (1826).

Platanthera psycodes LINDL. Orch. 294 (1839).

P. lacera GRAY, Ann. Lyc. N. Y. III, 228 (1836).

Wats. and Coult., Gray's Man. 6 ed. 509; Britt., Fl. N. J. 235; Upham, Fl. Minn. 140; Mac., Fl. Can. II, 19; Chap., Fl. S. St. 460; Cov., Fl. Ark. 222.

North America: N. S., N. Br., Ont. to N. Eng., N. J. and Ga.; W. to Minn., Mo. and Ark.

Minn. valley: N. E. and S. E. districts; rare or local; bogs and damp woodland.

HERB.: *Sandberg* 544, Cannon Falls.

Habenaria leucophaea (NUTT.) GRAY, Man. ed. V, 502 (1867).

Orchis leucophaea NUTT. Trans. Am. Phil. Soc. (II), V, 161 (1837).

Wats. and Coult., Gray's Man. 6 ed. 509; Webb., Fl. Neb. 109; Upham, Fl. Minn. 140; Mac., Fl. Can. II, 19; Cov., Fl. Ark. 222.

North America: N. S., N. B., Q., Ont. to W. N. Y., Ky. and Mo.; W. to Minn. and Neb.

Minn. valley: Forest district and N. W.; abundant; moist fields and meadow land.

HERB.: *Herrick* 292, Alexandria, Douglas Co.; *Leiberg* 69, Nicollet Co.

Habenaria hookeriana TORR. Ann. Lyc. N. Y. III, 229 (1836).

H. orbiculata GOLDIE, Edin. Phil. Jour. VI, 331 (1822).

Platanthera hookeriana LINDL. Orch. 286 (1839).

Wats. and Coult., Gray's Man. 6 ed. 508; Britt., Fl. N. J. 234; Upham, Fl. Minn. 140; Mac., Fl. Can. II, 17.

North America: N. S., N. Br., Q., Ont. to L. Huron and L. Superior region; S. to N. J., Minn., Iowa and Wisc.

Minn. valley: Forest district and principally N., N. E. and N. W.; local; damp woods and tamarack swamps.

HERB.: *Bailey* 194, Vermilion lake; *Sandberg* 543, Red Wing.

Habenaria dilatata (PURSH) HOOK. Fl. Exot. II, 95 (1823-27).

Orchis dilatata PURSH, Fl. Am. 588 (1814).

Platanthera hyperborea var. *dilatata* LINDL. in Beck. Bot. 347 (1833).

P. dilatata LINDL. Orch. 287 (1846).

Wats. and Coult., Gray's Man. 6 ed. 507; Upham, Fl. Minn. 140; Mac., Fl. Can. II. 15; Coult., Fl. Colo. 342; Richt., Pl. Eur. 281; Led., Fl. Ross. IV, 71; Wats., King Exp. 340; Roth., Wheel. Exp. 7, 17, 265; Rothr., Alask. 456.

Iceland and N. E. Asia; circumpolar.

North America: Atl. to Pac. in Can.; N. to Hudson Bay and Yukon region; S. to Conn., N. Y., Mich. and Minn.

Minn. valley: N. E. and N. W. districts; tamarack swamps.

HERB.: *Taylor* 1112, Glenwood; *Herrick* 291, Minneapolis; *Bailey* 324, St. Louis river; *Bailey* 290, St. Louis river.

Habenaria hyperborea (LINN.) R. BR. Hort. Kew. V, 193 (1813).

Orchis hyperborea LINN. Mant. I, 121 (1767).

O. koenigii RETZ. Fl. Scand. 1087 (1779).

Gymnadenia hyperborea LINK, Handb. I, 242 (1829).

Platanthera hyperborea and *koenigii*, a, LINDL. Orch. 286-287 (1846).

Wats. and Coult., Gray's Man. 6 ed. 507; Britt., Fl. N. J. 234; Upham, Fl. Minn. 140; Coult., Fl. Colo., 342; Mac., Fl. Can II, 14; Wats., Fl., Calif. II, 134; Richt., Pl. Eur. 281; Wats., King Exp. 340; Roth. Wheel Exp. 265.

Iceland.

North America: Greenland and Newf. to Ft. Franklin and Alaska; S. throughout Can. and to N. Eng., N. Y., N. J., S. Ill., Iowa, Minn. and Dak.; in mts. to S. Colo,

Minn. valley: Forest district, also N. and N. W. regions; abundant; damp woodland and swamps.

HERB.: *Taylor* 1106, Glenwood; *Taylor* 1107, Glenwood; *Sheldon* 1155, New Ulm; *Roberts* 127, North shore; *Kassube* 227, Minneapolis; *Arthur* 18, Vermilion lake; *Bailey* 43, Vermilion lake; *Bailey* 384, Mud lake.

Habenaria bracteata (WILLD.) R. BR. Hort. Kew. ed. 2, V, 192 (1813).

Orchis bracteata WILLD. Spec. IV, 34 (1805).

Satyrium bracteatum PERS. Syn. II, 507 (1807).

Peristylis bracteatus LINDL. Orch. 298 (1846).

Platanthera bracteata TORR. Fl. N. Y. II, 279 (1843).

Habenaria viridis var. *bracteata* REICH. DC. Prodr. XIII, 130 (1851).

Wats. and Coult., Gray's Man. 6 ed. 507; Britt., Fl. N. J. 234; Upham, Fl. Minn. 139; Chap., Fl. S. St. 460; Mac., Fl. Can. II, 14; Led., Fl. Ross, IV, 71; Webb., Appx. Neb. 26; Rothr., Alask 456.

Kamtschatka to the Caucasus mts.

North America: N. Br., Q., Ont. to Man., Rocky mts., Vancouver, Alaska; S. to N. Eng., N. J. and mts. of N. Car.; W. to Minn., Iowa, Ind. and Neb.

Minn. valley: Forest district and probably throughout; damp woods and tamarack swamps.

HERB.: *Sheldon* 434, Buffalo lake, Waseca Co.; *Sheldon* 562, Waseca; *Taylor* 215, Janesville; *Kassube* 226, Ramsey Co.; *Sandberg* 542, Red Wing; *Roberts* 126, Carlton's peak; *Leiberg* 68, Blue Earth Co.

Habenaria flava (LINN.) GRAY, Man. ed. V, 499 (1867).

Orchis flava LINN. Spec. 942 (1753).

O. virescens WILLD. Spec. IV, 37 (1805).

Habenaria herbiola R. BR. Hort. Kew. ed. 2, V, 193 (1813).

Orchis fuscescens and *herbiola* PURSH, Fl. Am. 587 (1814).

O. bidentata ELL. Sk. II, 448 (1824).

Habenaria virescens SPRENG. Syst. III, 688 (1826).

H. fuscescens TORR. Compend. 318 (1826).

Platanthera herbiola LINDL. Orch. 287 (1846).

P. flava GRAY, Man. ed. I, 471 (1848).

Wats. and Coult., Gray's Man. 6 ed. 507; Chap., Fl. S. St. 459; Upham, Fl. Minn. 139; Mac., Fl. Can. II, 13; Cov., Fl. Ark. 222.

North America: Ont. to Thunder bay and Kaministiquia river; S. to N. Eng., N. J., Fla.; W. to Minn. and Ark.

Minn. valley: N. E. district and N. edge; rare or local; damp woods or swamps.

HERB.: *Oestlund* 191, Minneapolis; *Sandberg* 541, Vasa.

Habenaria tridentata (WILLD.) HOOK. Fl. Bor. Am. II, (1840).

Orchis tridentata WILLD. Spec. IV. 41 (1805).

? *O. clavellata* MICHX. Fl. II, 155 (1803).

Platanthera tipuloides LINDL. Orch. 285 (1846).

Gymnadenia tridentata LINDL. Orch. 227 (1846).

Wats. and Coult., Gray's Man. 6 ed. 506; Britt., Fl. N. J. 234; Upham, Fl. Minn. 133; Mac., Fl. Can. II, 13; Cov., Fl. Ark. 223.

North America: Newf. N. Br., Q., Ont. to L. Huron and L. Superior; S. to N. Eng., N. J. and N. Car.; W. to Minn., Ind. and Ark.

Minn. valley: N. E. district; infrequent; damp woods and near springs.

HERB.: *Bailey 10a*, White Bear lake.

POGONIA JUSS. Gen. 65 (1789).

Nervilia GAUD. Freyc. Bot. Voy. 422 (1826).

Cordylia BLUME, Bij. 416 (1826).

Rophostemon BLUME, Fl. Jav. 6 (1828).

Aplostellis THOU. Orch. Ile. Afr. t. 24 (1806).

Haplostellis ENDL. Gen. 219 (1838).

Cleisthes L. C. RICH. Mem. Mus. Par. IV, 31 (1818).

Triphora NUTT. Gen. II, 192 (1818).

Codonorchis LINDL. Gen. et. Spec. Orch. 410 (1840).

Isotria and *Odonectis* RAF. Desf. Jour. Bot. I, 220, 221 (1808).

Didymoplexis GRIFF. Calc. Journ. IV, 383 (1844).

Benth. and Hook., Gen. Pl. III, 615; Durand, Ind. Gen. Phan. 401; Engler and Prantl, Nat. Pflanz. 2, VI, 106.

Living species: 43; cosmopolitan. N. America, 6; E. Sts., 5; Canada, 3; S. Sts., 4.

Pogonia ophioglossoides (LINN.) KER. Bot. Reg. 148 (1816).

Arethusa ophioglossoides LINN. Spec. 951 (1753).

Wats. and Coult., Gray's Man. 6 ed. 505; Upham, Fl. Minn. 141; Mac., Fl. Can. II, 11; Britt., Fl. N. J. 233; Chap., Fl. S. St. 457; Engl. Pfitzer, Nat. Pflanz. II, 6, 106.

Japan?

North America: Newf., N. S., N. Br., Q., Ont.; S. to N. Eng., N. J. and Fla.; W. to N. Ind. and Minn.

Minn. valley: N. E. and N. W. districts; local, bogs and tamarack swamps.

HERB.: *Oestlund 193*, Ramsey Co.; *Herrick 294*, Minneapolis; *Kassube 229*, Minneapolis; *Sandberg 549*, Chisago Co.; *Sandberg, 550*, Chisago Co.; *Herb. Sheld. 1756*, Ramsey Co.

ARETHUSA LINN. Gen. ed. V, 905 (1754).

Benth. and Hook., Gen. Pl. III, 614; Durand, Ind. Gen. Phan. 401; Engler and Prantl, Nat. Pflanz. 2, VI, 107 (Pfitzer).

Living species: 2; Japan, 1; Atl. N. Amer., 1.

Arethusa bulbosa LINN. Spec. 950 (1753).

Wats. and Coult., Gray's Man. 6 ed. 504; Britt., Fl. N. J. 232; Upham,

Fl. Minn. 141; Mac., Fl. Can. II, 10; Chap., Fl. S. St. 458; Engl. Pfitzer, Nat. Pflanz. II, 6, 107.

North America: Newf., N. S., N. Br., Q., Ont.; S. to N. J. and mts. of N. Car.; W. to Minn. and Ind.

Minn. valley: N. E. district; rare; bogs and tamarack swamps.

HERB.: *Sandberg 548*, Chisago Co.

GYROSTACHYS PERS. Syn. II, 511 (1807).

Spiranthes L. C. RICH. Mem. Mus. Par. IV, 50 (1818).

Aristotelea LOUR. Cochinch. 522 (1790) *not L'Her.*

Ibidium SALISB. Trans. Hort. Soc. I, 291 (1812).

Cyclopogon PRESL, Rel. Haenk. I, 93 (1830).

Sauroglossum LINDL. Bot. Reg. t. 1618 (1835).

Synassa LINDL. Bot. Reg. t. 1618 (1835).

Sarcoglottis PRESL, Rel. Haenk. I, 95 (1836).

Stenorhyncus L. C. RICH. Mem. Mus. Par. IV, 59 (1818).

Benth. and Hook., *Gen. Pl.* III, 596; Durand, *Ind. Gen. Phan.* 399; Engler and Prantl, *Nat. Pflanz.* 2, VI, 113 (Pfitzer).

Living species: 75–80; temperate and tropical regions. Russia, 4; Europe, 3; Atl. N. America, 13 (endemic); California, 2; S. Sts., 7; Canada, 4; E. Sts., 6.

Gyrostachys gracilis (BIGEL.) OK. Rev. Gen. II, 664 (1891).

Spiranthes gracilis BIGEL. Fl. Bost. 322 (1814).

Wats. and Coult., Gray's Man. 6 ed. 503; Britt., Fl. N. J. 232; Upham, Fl. Minn. 141; Mac., Fl. Can. II, 8; Chap., Fl. S. St. 462; Cov., Fl. Ark. 222.

North America: N. S., Q., Ont. to Man. and Saskatchewan; N. to Ft. Franklin on Mackenzie; S. to N. Eng., N. J. and Fl.; W. to Minn. and Ark.

Minn. valley: N. E. district, N. edge and N. W.; woods and hillsides in shaded places.

HERB.: *Bailey 15*, Vermilion lake; *Bailey 181*, Vermilion lake.

Gyrostachys cernua (LINN.) OK. Rev. Gen. II, 664 (1891).

Ophrys cernua LINN. Spec. 946 (1753).

Neottia cernua WILLD. Spec. IV, 75 (1805).

Spiranthes cernua RICH. Mem. Mus. IV, 59 (1817).

Neottia tortilis BARTON, Fl. N. Am. II, 35 (1822).

Wats. and Coult., Gray's Man. 6 ed. 502; Mac., Fl. Can. II, 8; Britt., Fl. N. J. 231; Upham, Fl. Minn. 140; Chap., Fl. S. St. 462; Cov., Fl. Ark. 222; Webb., Appx. Neb. 26.

North America: N. S., Q., Ont. to Georgian Bay; S. to N. Eng., N. J., Fla. and Miss.; W. to Minn., Neb., Mo. and Ark.

Minn. valley: Forest district; bogs and low, wet meadows.

HERB.: *Bailey* 354, Mud river; *Bailey* 559, Vermilion lake; *Bailey* 444, Long lake; *Sandberg* 547, "Minnesota."

Gyrostachys romanzowiana (CHAM.)

Neottia gemmipara SM. Engl. Fl. IV, 36 (1828).

Spiranthes romanzowiana CHAM. Linn. III, 27 (1828).

S. gemmipara LINDL. Syn. Br. Fl. 257 (1829).

Wats. and Coult., Gray's Man. 6 ed. 502; Webb., Fl. Neb. 109; Upham, Fl. Minn. 140; Coult., Fl. Colo. 343; Wats., Fl. Calif. II, 135; Mac., Fl. Can. II, 8; Led., Fl. Ross. IV, 84; Richt., Pl. Eur. 285; Hook., Fl. Gt. Brit. 387; Nym., Fl. Eur.; Wats., King Exp. 341; Roth., Wheel. Exp. 17, 265; Rothr., Alask. 456.

Ireland, Unalascha, Kamtschatka.

North America: Newf. to Vancouver; N. to Alaska and Arctic circle; S. in Sierras to Calif.; in Rockies to Colo.; E. to W. Neb., Dak., Minn., Mich., N. Eng. and Penn.

Minn. valley: Forest district and N. W. district; bogs and marshes.

HERB.: *Taylor* 1110, Glenwood; *Ballard* 894, St. Bonifacius; *Ballard* 867, Waconia; *Ballard* 714, Benton, Carver Co.; *Ballard* 824, Page lake, Carver Co.; *Ballard* 794, Goose lake, Carver Co.; *Herrick* 293, Minneapolis; *Kassube* 228, Minneapolis; *Sandberg* 546, Red Wing.

PERAMIUM SALISB. Trans. Hort. Soc. I, 301 (1812).

Goodyera R. BR. Hort. Kew. ed. 2, V, 197 (1813).

Gonogona LINK, Handb Bot. I, 248 (1829).

Tussaca RAF. Journ. Phys. LXXXIX, 261 (1819).

Epipactis HALL. Enum. Helv. I, 277 (1742) *not Crantz*.

Orchiodes TREW. Act. Caes. Car. III, 409 (1736).

Cionisaccus BREDÁ, Orch. Kuhl.-Hass. 1 (1827).

Cordylestylis FALC. Hook. Jour. Bot. IV, 74 (1841).

Leucostachys HOFFMANN, Preisv. Orch. (1842).

Georchis LINDL. Gen. et Spec. Orch. 495 (1840).

Benth. and Hook., Gen. Pl. III, 602; Durand, Ind. Gen. Phan. 400; Engler and Prantl, Nat. Pflanz. 2, VI, 117 (Pfitzer); O. Kuntze, Rev. Gen. II, 674.

Living species: 25; N. temperate regions to tropical Asia, N. Caledonia and the Mascarene Isls. Europe and Siberia, 1; N. America, 3; E. Sts., 2; California, 1; Canada, 3; S. Sts., 3; Rocky mts., 1.

Peramium pubescens (WILLD.) SALISB. Trans. Hort. Soc. 261 (1812).

Satyrium repens MICHX. Fl. N. Am. 157 (1803) *in part*.

Neottia pubescens WILLD. Spec. IV, 76 (1805).

Goodyera pubescens R. BR. Hort. Kew. V, 198 (1813).

Orchiodes pubescens OK. Rev. Gen. II, 675 (1891).

Wats. and Coult., Gray's Man. 6 ed. 503; Britt., Fl. N. J. 232; Mac., Fl. Can. II, 9; Upham, Fl. Minn. 140; Chap., Fl. S. St. 463.

North America: Newf., N. Br., Q., Ont. to L. Superior region and Man.; S. to N. Eng., N. J. and Fla.; W. to Mich. and Minn.

Minn. valley: N. edge; rare; shaded rich banks of streams and deep woods.

HERB.: *Juni 14*, Put-In-Bay; *Sandberg 545*, Cannon Falls.

Peramium repens (LINN.) SALISB. Trans. Hort. Soc. 261 (1812).

Satyrium repens LINN. Spec. 945 (1753).

Scrapias repens CHAIX. Vill. Dauph. II, 53 (1787).

Satyrium hirsutum GILIB. Exerc. Phyt. II, 484 (1792).

Neottia repens SW. Act. Holm. 226 (1800).

Goodyera repens R. BR. Hort. Kew V. 198 (1813).

Tussacia repens RAF. Journ. Phys. IV, 270 (1814).

Orchiodes repens OK. Rev. Gen. II, 674 (1891).

Wats. and Coult., Gray's Man. 6 ed. 503; Mac., Fl. Can. II, 9; Chap., Fl. S. St. 463; Upham, Fl. Minn. 140; Nym., Fl. Eur.; Richt., Pl. Eur. 286; Hook., Fl. Gt. Brit. 386; Led., Fl. Ross. IV, 86; Herd., Fl. Eur. Russ. 128; Engl. Pfitzer, Nat. Pflanz. II, 6, 117; Hart., Fl. Scand. I, 393.

N. and mid. Europe to Alps and Dalmatia; Siberia, Caucasus and Himalayas.

North America: N. S., N. Br., Q., Ont. to Man., Saskatchewan, N. W. T., Ft. Franklin on Mackenzie and Pac.; S. to Minn., Mich. N. Eng. and in Alleghenies to mts. of N. Car.

Minn. valley: N. E. district; rare and local; shaded banks and woods.

HERB.: *Roberts 129*, Cascade river; *Bailey 373*, Mud lake; *Roberts 130*, Grand Marais; *Holway 29*, Vermilion lake; *Bailey 177*, Vermilion lake; *Bailey 300*, St. Louis river.

ACHROANTHES RAF. Med. Rep. V, 350 (1808).

? **Malaxis** SW. Prodr. 8, 119 (1788).

Microstylis NUTT. Gen. II, 196 (1818).

Pedilea LINDL. Orch. Sel. 27 (1826).

Crepidium BLUME, Bij. 387 (1826).

Pterochilus HOOK. and ARN. Bot. Beech. 71 (1841).

Dienia LINDL. Gen. et Spec. Orch. 22 (1840).

Cheiropterocephalus RODRIG. ex Pfitz. l. c. (1888).

Benth. and Hook., Gen. Pl. III, 494; Durand, Ind. Gen. Phan. 386; Engler and Prantl, Nat. Pflanz. 2, VI, 130 (Pfitzer); O. Kuntze, Rev. Gen. II, 672.

Living species: 70; temperate N. hemisphere; tropical Asia and America. Russia, 5; Europe, 1; N. America, 2-3; Canada, 2; E. Sts., 2; S. Sts., 2; Pl. Wheel., 1.

Achroanthes unifolia (MICHX.) RAF. Med. Rep. V, 350 (1808).

Malaxis unifolia MICHX. Fl. N. Am. II, 157 (1803).

M. ophioglossoides WILLD. Spec. IV, 90 (1805).

Microstylis ophioglossoides NUTT. Gen. II, 196 (1818).

M. unifolia B. S. P. Cat. N. Y. (1888).

Wats. and Coult., Gray's Man. 6 ed. 498; Britt., Fl. N. J. 229; Mac., Fl. Can. II, 2; Upham, Fl. Minn. 141; Chap., Fl. S. St. 453; Herd., Fl. Eur. Russ. 126.

Russia ?

North America: Newf., N. S., N. Br., Q., Ont. to L. Winnipeg and Saskatchewan; S. to N. Eng., N. J. and Fla.; W. to Minn. and Mo.

Minn. valley: S. E. district; rare and local; damp woods or banks of streams.

LEPTORCHIS THOU. N. Bull. Soc. Phil. 314 (1809).

Cestichis THOU. Afr. Isls. (1818).

Liparis L. C. RICH. Mem. Mus. Par. IV, 52 (1818).

Sturmia REICH. Consp. 69 (1828).

Alipsa HOFFMANS. Linn. XVI, bb. 228 (1842).

Empusa LINDL. Bot. Reg. 825 (1836?).

Empusaria REICH. Consp. 69 (1828).

Ephippianthus REICH. F. Schmidt. Reise Am. Bot. 180 (—).

Platystylis BLUME, Bij. 389 (1826).

Gastroglottis BLUME, Bij. 397 (1826).

Benth. and Hook., Gen. Pl. III, 495; Durand, Ind. Gen. Phan. 386; O. Kuntze, Rev. Gen. II, 669; Engler and Prantl, Nat. Pflanz. 2, VI, 128, 130 (Pfitzer).

Living species: 100; temperate and tropical regions. Few in N. temperate zone. Canada, 1; E. Sts., 2; S. Sts., 1. N. America, 1-2; Europe, 1; Russian Europe, 1.

Leptorchis loeselii (LINN.).

Orchis loeselii LINN. Spec. 946 (1753).

? *Ophrys latifolia* LINN. Fl. Suec. ed. II, 316 (1755).

O. paludosa Fl. Dan. 877 (1782).

O. trigona GILIB. Exerc. Phyt. II, 488 (1792).

Cymbidium loeselii Sw. Nov. Act. Ups. 76 (1799).

Malaxis loeselii Sw. Holm. Act. Bot. 235 (1800).

M. correaana BART. Prodr. Phil. 86 (1815).

Liparis loeselii RICH. Mem. Mus. IV, 60 (1817).

Malaxis longifolia BART. Fl. Phil. II, 142 (1824).

Liparis correaana SPRENG. Syst. II, 740 (1825).

Sturmia loeselii REICHB. Pl. Crit. IV, 39 (1826).

Wats. and Coult., Gray's Man. 6 ed. 499; Britt., Fl. N. J. 230; Mac., Fl. Can. II, 3; Upham, Fl. Minn. 141; Richt., Pl. Eur. 286; Led., Fl. Ross. IV, 52; Nym., Fl. Eur.; Hook., Fl. Gt. Brit. 384; Herd., Fl. Eur. Russ. 126; Hart., Fl. Scand. I, 397.

Middle and N. Europe to Asia. S. to Italy and Turkey.

North America: N. S., N. Br., Q., Ont. to Saskatchewan; S. to N. J. and Md.; W. to Minn. and S. Ills.

Minn. valley: N. E. district; N. edge and N. W. district; tamarack swamps.

HERB.: *Taylor 1145*, Glenwood; *Ballard 621*, Chaska; *Herrick 297*, Minneapolis.

Leptorchis liliifolia (LINN.) OK. Rev. Gen. II, 671 (1891).

Ophrys liliifolia LINN. Spec. 946 (1753).

Cymbidium liliifolium WALT. Fl. Car. (1788).

Malaxis liliifolia WILLD. Spec. IV, 92 (1805).

Liparis liliifolia RICHL. Orch. Eur. 38 (1818).

Wats. and Coult., Gray's Man. 6 ed. 499; Britt., Fl. N. J. 230; Upham, Fl. Minn. 141; Chap., Fl. S. St. 454.

North America: N. Eng., N. J. and Ga.; W. to Minn. and Mo.

Minn. valley: N. E. and S. E. districts; rare and local; moist forests and swampy places.

HERB.: *Sandberg 553*, Vasa; *Holzinger 274*, Stockton.

CORALLORHIZA R. BR. Hort. Kew. ed. 2, V, 209 (1813).

Coralliorrhiza PFITZ. Nat. Pflanz. l. c. (1888).

Benth. and Hook., *Gen. Pl.* III, 497; Durand, *Ind. Gen. Phan.* 386; Engler and Prantl, *Nat. Pflanz.* 2, VI, 131 (Pfitzer).

Living species: 12; temperate N. regions. Russia, 3; Europe, 1; N. America, 7-8; California, 5; Rocky mts., 3; E. Sts., 4; Canada, 5; S. Sts., 3; Pl. King, 1; Pl. Wheel., 1.

Corallorhiza multiflora NUTT. Journ. Acad. Phil. III, 7 (1823).

C. innata NUTT. Gen. II, 194 (1818).

Wats. and Coult., Gray's Man. 6 ed. 500; Britt., Fl. N. J. 230; Mac., Fl. Can. II, 5; Coult., Fl. Colo. 341; Upham, Fl. Minn. 142; Wats., Fl. Calif. II, 131; Webb., Appx. Neb. 26.

North America: Newf. to Selkirks and Vancouver; S. to Wahsatch, Colo. river and San Diego; E. to Minn., Iowa, Neb., Mo., N. Eng. and N. J.

Minn. valley: N. districts; rare; drier or damp woods

HERB.: *Arthur 48*, Vermilion lake.

Corallorhiza corallorhiza (LINN.).

Ophrys corallorhiza LINN. Spec. 945 (1753).

Epipactis corallorhiza CR. Stirp. Austr. 464 (1769).

Cymbidium neottia SCOP. Fl. Carn. 2 ed. II, 207 (1772).

Helleborine corallorhiza SCHM. Fl. Böhm. 79 (1794).

Cymbidium corallorhiza SW. Act. Holm. 738 (1800).

Corallorhiza innata R. BR. Hort. Kew. V, 209 (1813).

Cymbidium nemoralis SW. Veg. Scand. 32 (1814).

Corallorhiza halleri RICH. Mem. Mus. IV, 61 (1817).

C. verna NUTT. Jour. Acad. Phil. 135 (1823).

C. intacta CHAM. and SCHLECHT. Linn. III, 35 (1828).

C. dentata HOST. Fl. Austr. II, 547 (1831).

Wats. and Coult., Gray's Man. 6 ed. 500; Britt., Fl. N. J. 230; Mac., Fl. Can. II, 4; Upham, Fl. Minn. 142; Chap., Fl. S. St. 454; Coult., Fl. Colo. 341; Wats., Fl. Calif. II, 132; Led., Fl. Ross, IV, 49; Hook., Fl. Gt. Brit. 385; Trautv., Fl. Sib. 113; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 126; Engl. Pfitzer, Nat. Pflanz. II, 6, 131; Hart., Fl. Scand. I, 397; Webb., Appx. Neb. 26; Rothr., Alask. 456.

Arctic, N. and mid. Europe; all Siberia to Kamtschatka.

North America: Canada throughout; S. to Washington and Colo.; E. to N. Eng. and mts. of Ga.

Minn. valley: N. districts; rare; swamps and deep woods.

HERB.: *Roberts 131*, Hoodoo Pt.; *Bailey 89*, Vermilion lake; *Bailey 247*, Vermilion lake.

CATHEA SALISB. Trans. Hort. Soc. I, 300 (1812).

Calopogon R. BR. Hort. Kew. ed. 2, V, 204 (1813).

Limodorum LINN. (1740) ex Kuntze l. c., *not Ludw.*

Helleborine MARTYN, Hist. Pl. t. 50 (1736).

Benth. and Hook., *Gen. Pl.* III, 615; O. Kuntze, *Rev. Gen.* II, 665; Durand, *Ind. Gen. Phan.* 401; Engler and Prantl, *Nat. Pflanz.* 2, VI, 150 (Pfitzer).

Living species: 4; N. America. S. Sts., 4; Canada, 1; E. Sts., 1.

Cathea tuberosa (LINN.) SALISB. Trans. Hort. Soc. I, l. c. (1812).

Limodorum tuberosum LINN. Spec. 950 (1753).

Cymbidium pulchellum WILLD. Spec. IV, 105 (1805).

Calopogon pulchellum R. BR. Hort. Kew. ed. 2, V, 204 (1813).

Calopogon tuberosus B. S. P. Cat. N. Y. (1888).

Helleborine tuberosus OK. Rev. Gen. II, 665 (1891).

Wats. and Coult., Gray's Man. 6 ed. 505; Mac., Fl. Can. II, 10; Upham, Fl. Minn. 141; Chap., Fl. S. St. 456; Britt., Fl. N. J. 232; Cov., Fl. Ark. 222.

North America: Newf., N. S., N. Br., Q., Ont.; S. to N. J. and Fla.; W. to Minn., Mo. and Ark.

Minn. valley: Forest district and far N. W.; not rare; peat bogs and tamarack swamps.

HERB.: *Taylor 1111*, Glenwood; *Kassube 230*, Rocky lake; *Oestlund 194*, Ramsey Co.; *Herrick 295*, Minneapolis; *Herrick 296*, Minneapolis; *Sandberg 551*, Chisago Co.; *Sandberg 552*, Red Wing.

APLECTRUM NUTT. Gen. II, 197 (1818).

Benth. and Hook., *Gen. Pl.* III, 497; Durand, *Ind. Gen. Phan.* 386; Engler and Prantl, *Nat. Pflanz.* 2, VI, 156 (Piltzer).

Living species: 1; N. America.

Aplectrum spicatum (WALT.) B. S. P. Cat. N. Y. (1888).

Arethusa spicata WALT. Fl. Car. 222 (1788).

Cymbidium hiemale MUHL. Willd. Spec. IV, 107 (1805).

Aplectrum hiemale NUTT. Gen. II, 197 (1818).

Corallorhiza hiemalis BART. Fl. N. Am. II, 52 (1822).

Wats. and Coult., Gray's Man. 6 ed. 500; Britt., Fl. N. J. 230; Mac., Fl. Can. II, 4; Upham, Fl. Minn. 142; Chap., Fl. S. St. 455; Wats., Fl. Calif. II, 133; Coult., Fl. Colo. 342; Engl. Piltzer, Nat. Pflanz. II, 6, 156; Cov., Fl. Ark. 222.

North America: Ont. to Saskatchewan and Oregon; S. to N. Eng., N. J. and Ga.; W. to Minn., Mo. and Ark.

Minn. valley: Forest district; local and rare; peat bogs and tamarack swamps.

HERB.: *Leiberg 70*, Blue Earth Co.; *Leiberg 71*, Blue Earth Co.; *Sandberg 554*, Washington Co.

DICOTYLEDONES.

ARCHICHLANYDEAE.

XXII. JUGLANDACEAE. Walnut Family.

Endlicher, *Gen. Pl.* 1125 (1840); Benth. and Hook., *Gen. Pl.* III, 397 (1880); Engler in *Engler and Prantl, Nat. Pflanz.* 3, I, 19 (1887).

Genera: 6; temperate regions of N. hemisphere; within the tropics in Central America and the Himalayan region. Tertiary and Cretaceous distribution to the Polar regions.

Species: 33, living; 30±, fossil in Upper Cretaceous, Tertiary and Quaternary beds.

JUGLANS LINN. Gen. 727 (1737) p. p.

Wallia ALEF. Bonplandia, 335 (1861).

Benth. and Hook., *Gen. Pl.* III, 398; Durand, *Ind. Gen. Phan.* 379; Engler and Prantl, *Nat. Pflanz.* 3, I, 24 (Engler); Schenck, *Palaeophyt.* 445.

Living species: 7-8; temperate N. hemisphere and in Jamaica. Europe and mid. Asia, 1; E. Asia and Japan, 2; Russian Europe, 1; N. America, 4-5; E. Sts., S. Sts., Canada, 2; Tex. and N. Mex., 1; California. 1.

Fossil species: 10±; Lower Cretaceous—*Juglandiphyl- lum*, Potomac region (*Fontaine*); Upper Cretaceous, Nebraska, Greenland (*Heer, Lesquereaux*); Tertiary, Alaska, Vancouver, Iceland, Spitzbergen (*Heer*), France (*Saporta*); Pliocene, Japan (*Nathorst*); France (*Saporta*).

Juglans nigra LINN. Spec. 997 (1753).*J. nigra oblonga* MARSH, Arbust. Amer. 67 (1785).*Wallia nigra* ALEF. Bonplandia, 334 (1861).

Wats. and Coult., Gray's Man. 6 ed. 467; Britt., Fl. N. J. 219; Mac., Fl. Can. I, 434; Webb., Fl. Neb. 110; Chap., Fl. S. St. 419; Upham, Fl. Minn. 125; Cov., Fl. Ark. 219; Engl., Nat. Pflanz. III, 1, 24.

Bolivia.

North America: N. of L. Erie to W. Mass. and Toronto; S. to Conn., N. J. and Fla.; W. to S. Minn., E. Neb., Kan. and Ark.

Minn. valley: Forest district to Redwood and Brown Cos.; rich woods; absent far N. E.

HERB.: *Taylor* 134, Janesville; *Sheldon* 807, Sigel township, Brown Co.; *Ballard* 552, Spring lake, Scott Co.; *Sheldon* 623, Wilton, Waseca Co.

Juglans cinerea LINN. Spec. 1415 (1753).*J. oblonga* MILL. Dict. (1768).*J. cathartica* MICHX. Arb. I, 166 (1810).*Carya cathartica* BART. Comp. Fl. Phil. II, 178 (1824).*Wallia cinerea* ALEF. Bonplandia 334 (1861).

Wats. and Coult., Gray's Man. 6 ed. 467; Britt., Fl. N. J. 219; Webb., Fl. Neb. 110; Mac., Fl. Can. I, 435; Upham, Fl. Minn. 125; Chap., Fl. S. St. 419; Cov., Fl. Ark. 219; Engl., Nat. Pflanz. III, 1, 25.

North America: N. Br., Q., Ont. to Georgian bay, N. Eng., N. J. to mts. of Ga.; W. to Minn., Dak., Neb., E. Kan. and Ark.

Minn. valley: Forest district throughout; dry or damp woods.

HERB.: *Sheldon* 379, Madison Lake, Blue Earth Co.; *Sheldon* 789, Sleepy Eye; *Ballard* 53n, Chaska; *Taylor* 88, Elysian; *Taylor* 668, Cobb river, Blue Earth Co.; *Holzinger* 214, Winona Co.; *Holzinger* 215, Winona bluffs; *Herb. Sheld.* 1864, Minneapolis.

SCORIA RAF. Med. Rep. (1808).**Hicoria** RAF. Fl. Lud. (1817).**Carya** NUTT. Gen. II, 220 (1818).

Benth. and Hook., *Gen. Pl.* III, 398; Durand, *Ind. Gen. Phan.* 379; O. Kuntze, *Rev. Gen.* II, 637; Engler and Prantl, *Nat. Pflanz.* 3, I, 25 (Engler); Schenck, *Palaeophyt.* 447.

Living species: 10; N. America. S. Sts., 9; E. Sts., 7; Canada, 4; Mex., 1.

Fossil species: 10-15; Tertiary, Greenland (*Heer*); Spitzbergen (*Unger, Heer*); Italy (*Brongniart*); France, Hungary, Bohemia, Cantal (*Saporta, Unger, Göppert, Heer*); Wyoming and Colo. (*Lesquereaux*).

Scoria minima (MARSH.).

Juglans alba-minima MARSH. Arbust. Amer. 68 (1785).

J. angustifolia LAM. Enc. Meth. IV, 504 (1797).

J. amara MICHX. Sylv. I, 177 (1810).

Hicoria amara RAF. Fl. Lud. 109 (1817).

Carya amara NUTT. Gen. II, 222 (1818).

Hicoria minima BRITT. Torr. Bull. XV, (1888).

Wats. and Coult., Gray's Man. 6 ed.; Upham, Fl. Minn. 125.

Minn. valley: Forest district, throughout; damp woods and banks of streams.

HERB.: *Sheldon* 312, Madison Lake, Blue Earth Co.; *Ballard* 88, Chaska; *Sheldon* 814, Sigel township, Brown Co.; *Herrick* 274, Minnetonka; *Leiberg* 59, Blue Earth Co.; *Holzinger* 252, Winona Co.

Scoria ovata (MILL.).

Juglans ovata MILL. Dict. (1768).

? *J. squamosa* LAM. Enc. Meth. IV, 504 (1797).

J. compressa GAERTN. Fruct. II, 50 (1791).

J. alba MICHX. Fl. N. Am. II, 193 (1803).

Carya microcarpa NUTT. Gen. II, 221 (1818).

C. alba NUTT. Gen. II, 221 (1818).

Hicoria ovata BRITT. Torr. Bull. XV, (1888).

Wats. and Coult., Gray's Man. 6 ed. 468; Mac. Fl. Can. I, 433; Webb., Fl. Neb. 110; Chap., Fl. S. St. 418; Cov., Fl. Ark. 219; Engl., Nat. Pflanz. III, 1, 25; Upham, Fl. Minn. 125.

North America: N. of Lake Erie and to St. Clair river; N. Eng., N. J. to Fla.; W. to Minn., Neb., Kan. and N. Mex.

Minn. valley: Reported from the S. E. edge; rich woodland.

XXIII. MYRICACEAE. Sweet-Gale Family.

Endlicher, *Gen. Pl.* 270 (1840); Benth. and Hook., *Gen. Pl.* III, 400 (1880); Engler, in *Engler and Prantl, Nat. Pflanz.* 3, I, 26 (1887).

Genera: 1; temperate and warmer regions except Australia. Tertiary distribution principally European and N. American to Greenland; and Asia to Saghalin.

Species: 35 ±; fossil sp. very numerous.

MYRICA LINN. Gen. 744 (1737).

Nageia GAERTN. Fruct. I, 191 (1788).

Morella LOUR. Cochinch, 548 (1790).

Comptonia BANKS, Gaertn. Fruct. II, 58 t. 90 (1791).

Faya WEBB. Phyt. Can. IV, 272 (1847).

Gale SPACH. Suit. Buff. XI, 258 (1842).

Baillon, *Hist. Pl.* VI, 259; Benth. and Hook., *Gen. Pl.* III, 400; Durand, *Ind. Gen. Phan.* 380; Engler and Prantl, *Nat. Pflanz.* 3, I, 27 (Engler); Schenck, *Palaeophyt.* 452.

Living species: 30–35; temperate and warmer regions, except Australia. Only 2 species in Europe. N. America, 6; Canada, 4; California, 2; Tex.-Mex., 1; S. Sts., 3; E. Sts., 3.

Fossil species: A large number in the Tertiary of Europe, Saghalin, Greenland; Cretaceous in N. America.

Myrica asplenifolia (LINN.) BAILL. Hist. Pl. VI, 242 (1877).

Liquidambar asplenifolium LINN. Spec. 1418 (1753).

Comptonia asplenifolia BANKS, Gaert. Fruct. II, 58 (1791).

Liquidambar peregrinum REICH. ex Steud. Nom. II, 54 (1840).

Myrica comptonia C. DC. Prodr. XVI, 2, 151 (1864).

Wats. and Coult., Gray's Man. 6 ed. 470; Britt., Fl. N. J. 220; Upham, Fl. Minn. 127; Mac., Fl. Can. I, 435; Chap., Fl. S. St. 427; Engl., Nat. Pflanz. III, 1, 28.

North America: N. S., N. Br., Q., Ont. to Man. and Saskatchewan; S. to N. Eng., N. J. and N. Car.; W. to Minn. and Ind.

Minn. valley: Reported from region S. of L. Minnetonka and along N. edge; rare or doubtful; dry wooded hills.

XXIV. SALICACEAE. Willow Family.

Endlicher, *Gen. Pl.* 290 (1840); Benth. and Hook., *Gen. Pl.* III, 411 (1880); Pax, in Engler and Prantl, *Nat. Pflanz.* 3, I, 29 (1887).

Genera: 2; N. temperate zone and a few in tropical regions; according to Pax four distributional centers; (1) Behring straits district; (2) central Europe; (3) Himalayas, (4) Pacific N. America.

Species: 178; 50–60 fossil, extending in the middle Tertiary from N. polar to N. temperate regions.

POPULUS LINN. Gen. 755 (1737).

Benth. and Hook., *Gen. Pl.* III, 412; Durand, *Ind. Gen. Phan.* 381; Engler and Prantl, *Nat. Pflanz.* 3, I, 35 (Pax); Schenck, *Palaeophyt.* 464.

Living species: 18; Europe, Asia (Mid., Mount. and N.); N. America and Mexico. N. America, 10–11; Russian Europe, 9; Canada, 6–7; E. Sts., 5; California, 3–4; S. Sts., 4; Rocky mts., 4; Pl. King, 4; Pl. Wheel., 4.

Fossil species: Lower Cretaceous, Potomac region, 3 sp. (*Fontaine*)—*Populophyllum*; Upper Cretaceous, Greenland (*Heer*); N. America (*Lesquereaux*); Tertiary—Greenland, Saghalin, Spitzbergen, Alaska, California, Wyoming, Minn., Europe. 30–40 described, but scarcely so many distinct.

Populus monilifera AIT. Hort. Kew. III, 406 (1789).

P. angulata AIT. Hort. Kew. III, 407 (1789).

P. laevigata AIT. Hort. Kew. III, 406 (1789).

P. angulosa MICHX. Fl. N. Am. II, 243 (1803).

P. canadensis MICHX. f. Hist. Arb. III, 302 (1819).

P. macrophylla LODD. Cab. (1836).

Wats. and Coult., Gray's Man. 6 ed. 487; Britt., Fl. N. J. 227; Mac., Fl. Can. I, 457; Upham, Fl. Minn. 131; Webb., Fl. Neb. 110; Chap., Fl. S. St. 431; Coult., Fl. Colo. 339; Herd., Fl. Eur. Russ. 118; Wats., King. Exp. 327; Roth., Wheel. Exp. 242; Cov., Fl. Ark. 221; Engl. Pax, Nat. Pflanz. III, 1, 35.

Introduced into Russia.

North America: Q., Ont. to Saskatchewan and Assiniboia and Rockies; S. to W. N. Eng., N. J. and Fla.; W. to Colo., Kan., Ind. Terr. and Rocky mts.

Minn. valley: Throughout; woods, shores of lakes and banks of streams.

HERB.: *Taylor* 40, Elysian; *Sheldon* 1580, Lake Benton; *Taylor* 632, Minnesota lake; *Sheldon* 449, Madison Lake, Blue Earth Co.; *Holzinger* 261, Winona Co.; *Oestlund* 181, Hennepin Co.; *Sandberg* 520, Cannon Falls; *Herb. Wickersheim* 226, Lake Park, Becker Co.

***Populus balsamifera* LINN. Spec. 1034 (1753).**

P. tacamahaca MILL. Dict. (1768).

P. balsamifera lanceolata MARSH. Arbust. 108 (1785).

P. candicans AIT. Hort. Kew. III, 406 (1789).

P. viminea BON. Jard. 565 (1845).

P. balsamifera var. *genuina* WESMAEL, DC. Prodr. XVI, 2, 329 (1868).

Wats. and Coult., Gray's Man. 6 ed. 487; Britt., Fl. N. J. 227; Webb., Fl. Neb. 110; Upham, Fl. Minn. 131; Coult., Fl. Colo. 339; Mac., Fl. Can. I, 456; Herd., Fl. Eur. Russ. 118; Wats., King Exp. 327; Roth., Wheel. Exp. 242; Engl. Pax, Nat. Pflanz. III, 1, 35; Hart., Fl. Scand. I, 567, 568; Rothr., Alask. 454.

Introduced in Russia and Scandinavia.

North America: Saskatchewan and Man. to Alaska and Mackenzie; N. in Arctic circle; S. to N. Eng., N. J., Mich., Minn., Neb. and Colo.

Minn. valley: N. W. edge and N. E. district; sparingly represented; borders of streams and swamps.

HERB.: *Bailey* 162, Vermilion lake; *Sandberg* 521, Cannon Falls; *Sandberg* 522, Agate bay.

***Populus grandidentata* MICHX. Fl. N. Am. II, 243 (1803).**

P. grandidentata var. *pendula* TORR. Comp. Fl. N. St. 375 (1824).

Wats. and Coult., Gray's Man. 6 ed. 486; Britt., Fl. N. J. 227; Upham, Fl. Minn. 130; Mac., Fl. Can. 456; Chap., Fl. S. St. 431.

North America: N. S., N. Br., Q., Ont. to N. Car.; W. to N. Minn. and Tenn.

Minn. valley: N. E. and N. W. districts; dry hills, banks of streams and woods.

HERB.: *Oestlund* 180, Hennepin Co.; *Bailey* 2a, Hunter's island.

***Populus tremuloides* MICHX.** Fl. N. Am. II, 243 (1803).

P. trepida WILLD. Spec. IV, 803 (1805).

P. atheniensis HORT. ex Koch, Dendrol. II, 486 (1873).

P. tremuliformis EM. Trees of Mass. 243 (1878).

Wats. and Coult., Gray's Man. 6 ed. 486; Britt., Fl. N. J. 227; Mac., Fl. Can. I, 456; Webb., Fl. Neb. 110; Upham, Fl. Minn. 130; Coult., Fl. Colo. 339; Wats., Fl. Calif. II, 91; Wats., King Exp. 327; Roth., Wheel. Exp. 51, 242.

North America: Newf. and Labrador to Hudson Bay and Alaska; S. to Sacramento valley and N. Mex.; E. to N. Eng., N. Ky., N. J. and Penn.

Minn. valley: Throughout; damp woodland; near lakes and along streams.

HERB.: *Ballard* 227n, Jordan, Scott Co.; *Sheldon* 47, Elysian; *Taylor* 481, Janesville; *Bailey* 158, Vermilion lake; *Sandberg* 519, Cannon Falls; *Herb. Sheld.* 1770, Minneapolis; *Herb. Moyer* 225, Montevideo.

***SALIX* LINN.** Gen. 742 (1737).

Benth. and Hook., *Gen. Pl.* III, 411; Durand, *Ind. Gen. Phan.* 381; Engler and Prantl, *Nat. Pflanz.* 3, I, 36 (Pax); Schenck, *Palaeophyt.* 463.

Living species: 160; all regions except Australia, Malay Archip. and Oceanica. Russia, 70; Europe, 60; N. America, 70; Canada, 60; E. Sts., 20; Rocky mts., 16; California, 23; S. Sts., 7; Pl. King, 7; Pl. Wheel., 9; Russian Europe, 58.

Fossil species: Potomac, lower Cretaceous, 3 sp. (*Fontaine*) *Salicophyllum* —upper Cretaceous, N. America, Asia and Europe; Tertiary, abundant; Europe, Greenland, California; Diluvial, abundant; peat bogs, etc. (*Nathorst*, *Warming*, *Steensrup*), 15–20 sp.

***Salix myrtilloides* LINN.** Spec. 1446 (1753).

S. arbuscula PALL. Fl. Russ. II, 83 (1788).

S. elegans BESS. Enum. 77 (1822).

S. pedicellaris HOOK. Fl. Bor.-Am. II, 150 (1840).

Wats. and Coult., Gray's Man. 6 ed. 485; Britt., Fl. N. J. 227; Upham, Fl. Minn. 130; Mac., Fl. Can. I, 451; Herd., Fl. Eur. Russ. 118; Engl. Pax, *Nat. Pflanz.* III, 1, 37; Led., Fl. Ross. III, 613; Hart., Fl. Scand. I, 369; Rothr., Alask. 454.

Russia and Siberia.

North America: N. Br. and Atl. coast to Coast range;

N. to Ft. Franklin on Mackenzie and Alaska; Arctic circle in Labrador; S. to N. J., Iowa, Dak.

Minn. valley: Forest, N. W. and W. districts; absent S. W.; peat bogs and marshy meadows around lakes.

HERB.: *Sheldon* 238, Turtle lake, Le Sueur Co.; *Sheldon* 325, Smith's Mills, Blue Earth Co.; *Sheldon* 124, Madison Lake, Blue Earth Co.; *Sheldon* 527, Waseca; *Ballard* 445, Prior's lake, Scott Co.; *Sheldon* 1619, Minneapolis; *Bailey* 317, Vermilion lake; *Leiberg* 61, Blue Earth Co.; *Kassube* 220, Minneapolis; *Sandberg* 517, Chisago Co.; *Sandberg* 518, Chisago lake; *Bailey* 137, Vermilion lake (var. *pedicillaris* Carey).

***Salix cordata* MUHL.** N. Berl. Schr. IV, 236 (1801).

S. rigida MUHL. Willd. Spec. IV, 667 (1805).

Wats. and Coult., Gray's Man. 6 ed. 484; Britt., Fl. N. J. 226; Webb., Fl. Neb. 110 in var.; Mac., Fl. Can. 446; Coult., Fl. Colo. 335; Wats., Fl. Calif. II, 85; Upham, Fl. Minn. 129; Wats., King Exp. 324.

North America: N. Br. to Vancouver and N. W. T.; S. to N. Eng., N. J. and Ga.; W. to Rockies and W. Colo.

Minn. valley: Forest district and probably throughout; low banks and marshes.

HERB.: *Sandberg* 509, Vasa; *Sandberg* 510, Red Wing.

***Salix cordata* MUHL. var. *angustata* (PURSH) ANDERS.** Monog. 159 (1867).

S. angustata PURSH, Fl. Am. 613 (1814).

Wats. and Coult., Gray's Man. 6 ed. 484; Britt., Fl. N. J. 226; Mac., Fl. Can. I, 447; Upham, Fl. Minn. 129.

North America: Ont. to N. Eng. and N. J.; W. to Minn. and Mo.

Minn. valley: Reported from N. edge; infrequent; low banks and marshes.

***Salix candida* WILLD.** Spec. IV, 708 (1805).

S. incana MICHX. Fl. N. Am. II, 225 (1803).

S. tomentosa SCHRAD. in Herb.

S. nivea SM. in Herb.

Wats. and Coult., Gray's Man. 6 ed. 484; Britt., Fl. N. J. 225; Mac., Fl. Can. I, 446; Upham, Fl. Minn. 128; Coult., Fl. Colo. 337.

North America: Labrador, Anticosti, Q., Ont. to Hudson Bay, Saskatchewan and N. W. T.; S. to N. Eng., N. J., Iowa and Minn.; also, to Mont. and Colo.

Minn. valley: Forest district; especially N. E. district; banks of streams and lakes.

HERB.: *Sheldon* 1613, Ramsey Co.; *Kassube* 217, Minneapolis; *Bailey* 392, Mud lake; *Bailey* 360, Mud river; *Sandberg* 506, Goodhue Co.

Salix petiolaris SM. Linn. Trans. VI, 122 (1802).*S. grisea* WILLD. Spec. IV, 699 (1805).*S. fuscata* and *rosmarinifolia* PURSH, Fl. Am. II, 612 (1814).*S. sericea* MUHL. Berl. Mag. IV. 240 (1804).*S. pennsylvanica* SAL. Wob. t. 95 (—).*S. grisea* var. *subglabrata* KOCH, Comm. 21 (1828).*S. petiolaris* var. *gracilis* ANDERS. Sal. Monog. 109 (1867).

Wats. and Coult., Gray's Man. 6 ed. 483; Britt., Fl. N. J. 225; Mac., Fl. Can. I, 453; Upham, Fl. Minn. 129.

North America: N. B., Ont., Man. to Brit. Col.; S. to N. J. and Va.; W. to Minn. and Mont.

Minn. valley: N. E. and S. E. district; banks of streams and low meadows.

HERB.: *Bailey* 359, Mud river. *Sandberg* 610, Goodhue Co.; var. *gracilis* Anders., *Sheldon* 1929, Lake Harriet; *Bailey* 143, Vermilion lake; *Bailey* 361, Mud river.**Salix tristis** AIT. Hort. Kew. III, 393 (1789).*S. longirostris* MICHX. Fl. N. Am. II, 226 (1803).*S. muhlenbergiana* WILLD. Spec. IV, 692 (1805).

Wats. and Coult., Gray's Man. 6 ed. 483; Britt., Fl. N. J. 225; Upham, Fl. Minn. 129; Mac., Fl. Can. I, 455; Chap., Fl. S. St. 430; Webb., Appx. Neb. 27.

North America: N. S. to N. Eng., N. J. and mts. of Ga.; W. to Minn., Neb. and Mo.

Minn. valley: Forest district; infrequent or local; river or lake banks.

HERB.: ? *Holzinger* 257, Winona.**Salix humilis** MARSH. Arbust. Amer. 140 (1785).*S. conifera* WILLD. Pursh, Fl. I, 612 (1814).*S. longirostris* MICHX. Fl. N. Am. II, 226 (1803).*S. muhlenbergiana* PURSH, Fl. Am. I, 609 (1814).

Wats. and Coult., Gray's Man. 6 ed. 483; Britt., Fl. N. J. 225; Webb., Fl. Neb. 110; Upham, Fl. Minn. 129; Mac., Fl. Can. I, 449; Chap., Fl. S. St. 430; Mac., Fl. Can. II, 358; Cov., Fl. Ark. 221.

North America: N. S., N. Br., Q. Ont., to Lake Huron region and Man.; S. to N. Eng., N. J. and N. Car.; W. to Minn. and Neb.

Minn. valley: Forest district; dry, sandy places and barrens.

HERB.: *Sheldon* 372, Madison Lake, Blue Earth Co.; *Sheldon* 1615, Minneapolis; *Sandberg* 507, Red Wing; *Bailey* 221, Vermilion lake; *Bailey* 408, Burntside lake; *Bailey* 130, Vermilion lake; *Bailey* 286, Vermilion lake; *Kassube* 218, Minneapolis.

Salix discolor MUHL. N. Schrift. Ges. Nat. Fr. Berl. IV, 234 (1801).

S. prinoides PURSH, Fl. Am. 613 (1814).

S. sensitiva BARR. Sal. Am. 8 (1840).

Wats. and Coult., Gray's Man. 6 ed. 482; Britt., Fl. N. J. 225; Mac., Fl. Can. I, 447; Chap., Fl. S. St. 430; Upham, Fl. Minn. 129; Cov. Fl. Ark.

North America: N. S., N. Br., Q., Ont. to Man.; S. to N. Eng., N. J. and Car.; W. to Minn. and Mo.

Minn. valley: Throughout; river banks, lake shores and low meadows.

HERB.: *Sheldon* 1582, Lake Benton; *Taylor* 724, Minnesota lake; *Sheldon* 242, Lake Washington, Le Sueur Co.; *Herrick* 276, Minneapolis; *Sandberg* 508, Red Wing.

Salix rostrata RICH. Appx. Frankl. 3 (1823).

S. vagans var. *rostrata* ANDERS. Monog. 8 (1867).

S. livida var. *occidentalis* GRAY, Man. 5 ed. 464 (1867).

Wats. and Coult., Gray's Man. 6 ed. 482; Britt., Fl. N. J. 226; Upham, Fl. Minn. 130; Mac., Fl. Can. I, 453; Coult., Fl. Colo. 337; Roth., Wheel. Exp. 240; Webb., Appx. Neb. 27.

North America: Canada throughout to N. Eng., N. J.; W. to Minn., Mont. and Idaho; S. to Neb.

Minn. valley: Forest district and at least to Pomme des Terres valley; moist and shaded places or drier ground.

HERB.: *Taylor* 521, Mud lake, Waseca Co.; *Sandberg* 511, Red Wing; *Sandberg* 512, Cannon Falls; *Holzinger* 258, Winona; *Bailey* 212, Vermilion lake; *Bailey* 284, Vermilion lake; *Bailey* 334, St. Louis river.

Salix longifolia MUHL. N. Berl. Schr. IV, 238 (1801),

? *S. rubra* RICH. Appx. Frankl. Narr. 37 (1823).

S. fluviatilis NUTT. Sylv. 89 (1842).

S. longifolia var. *pedicillata* ANDERS. Königl. Sven. Acad. Handl. VI, 55 (1858).

Wats. and Coult., Gray's Man. 6 ed. 482; Britt., Fl. N. J. 227; Upham, Fl. Minn. 130; Mac., Fl. Can. I, 450; Webb., Fl. Neb. 110; Coult., Fl. Colo. 335; Wats., Fl. Calif. II, 84; Herd, Fl. Eur. Russ. 120?; Roth., Wheel. Exp. 240; Wats., King Exp. 324; Cov., Fl. Ark. 221; Engl. Pax, Nat. Pflanz. III, 1, 36.

Russia?

North America: Q., Ont. to Man., Athabasca and N. Brit. Col.; N. to Mackenzie river region; S. to Oregon, Calif., Texas; E. to Md. and Maine.

Minn. valley: Throughout; abundant; river banks and sandy shores.

HERB.: *Sheldon* 438, Buffalo lake, Waseca Co.; *Sheldon* 639 Waseca; *Taylor* 428, Buffalo lake, Waseca Co.; *Sheldon* 639½,

Wilton, Waseca Co.; *Sheldon* 1350, Verdi, Lincoln Co.; *Sheldon* 725, Sleepy Eye; *Ballard* 285, Jordan, Scott Co.; *Taylor* 641, Minnesota lake; *Taylor* 792, Glenwood; *Sheldon* 168, Madison Lake, Blue Earth Co.; *Sheldon* 288, Lake Washington, Blue Earth Co.; *Sandberg* 515, Red Wing; *Holzinger* 259, Winona; *Leiberg* 60, Blue Earth Co.; *Sandberg* 516, Wyoming.

***Salix lucida* MUHL.** Nov. Act. Soc. Nat. Scrut. Berl. IV, 667 (1801).

S. pentandra NUTT. Sylv. 77 (1842).

Wats. and Coult., Gray's Man. 6 ed. 481; Britt., Fl. N. J. 226; Mac., Fl. Can. I, 450; Webb., Fl. Neb. 110; Upham, Fl. Minn. 130; Engl. Pax, Nat. Pflanz. III, 1, 36.

North America: Canada, east of the Rockies; S. to N. Eng., N. J., Penn.; W. to Neb. and Colo.

Minn. valley: Throughout; banks of streams and shores of lakes.

HERB.: *Taylor* 156, Janesville; *Sheldon* 22, Elysian; *Ballard* 216n, Jordan, Scott Co.; *Herrick* 277, Minneapolis; *Kassube* 219, Minneapolis; *Bailey* 358, Mud river; *Sandberg* 513, Vasa; *Bailey* 357, Mud river (var. *serissima* Bail.).

***Salix amygdaloides* ANDERS.** Königl. Sven. Acad. Handl. VI, 21 (1858).

? *S. melanopsis* NUTT. Sylv. I, 78 (1842).

Wats. and Coult., Gray's Man. 6 ed. 481; Webb., Fl. Neb. 110; Mac., Fl. Can. I, 444; Upham, Fl. Minn. 130; Coult., Fl. Colo. 334; Roth., Wheel. Exp. 240.

North America: Red and Saskatchewan valleys to Minn., Mo. and Tenn.; W. to Neb. and Oregon; E. to C. New York.

Minn. valley: Forest district; perhaps throughout; banks of streams and shores of lakes.

HERB.: *Sheldon* 1618, Minneapolis; *Taylor* 39, Elysian.

***Salix nigra* MARSH.** Arbust. Amer. 293 (1785).

S. pentandra WALT. Fl. Car. 243 (1788).

S. caroliniana MICHX. Fl. N. Am. II, 226 (1803).

S. houstoniana PURSH, Fl. Am. 614 (1814).

S. falcata PURSH, Fl. Am. II, 614 (1814).

S. ligustrina MICHX. f. Sylv. II, 212 (1819).

S. nigra var. *falcata* GRAY, Man. 417 (1858).

Wats. and Coult., Gray's Man. 6 ed. 480; Britt., Fl. N. J. 226; Mac., Fl. Can. I, 451; Webb., Fl. Neb. 110; Chap., Fl. S. St. 430; Upham, Fl. Minn. 130; Wats., Fl. Calif. II, 83; Cov., Fl. Ark. 221; Engl. Pax, Nat. Pflanz. III, 1, 36.

North America: N. Br., Q., Ont. to L. Superior region, Man. and N. W. T.; S., W. of Sierra Nevada and Rockies

to Gulf of Mexico; E. from Neb. and Ark. to N. Eng., N. J. and Fla.

Minn. valley: Forest district and probably westward; banks of streams and shores of lakes.

HERB.: *Sheldon* 477, Madison Lake, Blue Earth Co.; *Sandberg* 514, Cannon Falls.

XXV. BETULACEAE. Birch Family.

Endlicher, *Gen. Pl.* 272 (1840); Benth. and Hook., *Gen. Pl.* III, 403 (1880)—Trib. I, II, *Cupuliferae*; Lindl., *Veg. King.* 251 (1846)—*Corylaceae*; Baillon, *Hist. Pl.* VI, 217 (1877)—*Castaneaceae* in part; Prantl, *Engler and Prantl, Nat. Pflanz.* 3, I, 39 (1887).

Genera: 6; N. extropical regions; a few to Bengal and the Argentine Republic; from Himalayan and Cordilleran distribution centers. Circumpolar in Tertiary.

Species: 70±, living; 100+, fossil.

CARPINUS LINN. *Gen.* 729 (1737) p. p. em. Scop. (1760).

Distegocarpus SIEB. and ZUCC. *Fam. Nat. Jap.* II, 102 (1837).

Baillon, *Hist. Pl.* VI, 255 (*part*); Benth. and Hook., *Gen. Pl.* III, 405; Durand, *Ind. Gen. Phan.* 380; Engler and Prantl, *Nat. Pflanz.* 3, I, 42; Schenck, *Palaeophyt.* 421.

Living species: 12; Middle and S. Europe; C. and E. Asia; Atl. N. America to Mexico. Europe, 2; Russia, 2; Japan, 4-5; N. America, 1.

Fossil species: 25; Tertiary of Greenland, Oregon, Alaska, Spitzbergen, Saghalin, Japan (*Unger, Heer, Göppert*, etc.). Quaternary, Japan and Canada?

Carpinus caroliniana WALT. *Fl. Car.* 236 (1788).

C. betulus virginiana MARSH. *Arbust.* 25 (1785).

C. americana LAM. *Enc. Meth.* IV, 708 (1797).

C. virginiana MICHX. f. *Sylv.* III, 56 (1813).

Wats. and Coult., *Gray's Man.* 6 ed. 474; Britt., *Fl. N. J.* 221; Mac., *Fl. Can.* I, 439; Chap., *Fl. So. St.* 425; Upham, *Fl. Minn.* 127; Cov., *Fl. Ark.* 220; Engl., *Nat. Pflanz.* III, 1, 43.

North America: N. S.?, Q., Georgian Bay; S. to N. Eng., N. J., Fla.; W. to Minn., Iowa, Kan. and Tex.

Minn. valley: Forest and N.W. districts; along streams and around lakes.

HERB.: *Sheldon* 337, Madison Lake, Blue Earth Co.; *Oestlund* 179, Minnehaha; *Sandberg* 502, Vasa; *Herb. Wickersheim* 115, Lake Park, Becker Co.

OSTRYA SCOP. *Fl. Carn.* 414 (1760).

Baillon, *Hist. Pl.* VI, 255 (*sub Carpinus*); Benth. and Hook., *Gen. Pl.* III, 406; Durand, *Ind. Gen. Phan.* 381; Engler and Prantl, *Nat. Pflanz.* 3, I, 43 (Prantl); Schenck, *Palaeophyt.* 418.

Living species: 2; S. Europe and the Orient, 1; Japan, N. America and Mexico, 1.

Fossil species: 6 Tertiary, Greenland, Aix, Switzerland, Japan (*Saporta*, *Heer*, *Nathorst*); *O. ostrya* (Linn.) in Tertiary of Japan.

***Ostrya ostrya* (LINN.).**

Carpinus ostrya LINN. Spec. 998 (1753) *in part*.

C. virginiana MILL. Dict. (1768).

C. triflora MOENCH, Meth. 394 (1794).

C. ostrya var. *americana* MICHX. Fl. N. Am. II, 202 (1803).

Ostrya virginica WILLD. Spec. IV, 469 (1805).

O. virginiana KOCH, Dendr. II, 2, 8 (1873).

Wats. and Coult., Gray's Man. 6 ed. 474; Mac., Fl. Can. I, 430; Britt., Fl. N. J. 222; Webb., Fl. Neb. 109; Chap., Fl. S. St. 426; Upham, Fl. Minn. 127; Cov., Fl. Ark. 220; Engl. Prantl, Nat. Pflanz. III, 1, 43.

Japan.

North America: Cape Breton, N. S., N. Br., N. Superior region to Man.; S. to N. Eng., N. J. and Fla.; W. to Minn., Neb., Wyom., Kan., Ark., and S. to Mexico.

Minn. valley: Throughout, principally forest district; rich woods and along streams.

HERB.: *Ballard* 293n, Jordan, Scott Co.; *Taylor* 884, Glenwood; *Ballard* 396, Jordan, Scott Co.; *Holzinger* 255, Winona Bluffs; *Oestlund* 178, Hennepin Co.; *Sandberg* 501, Cannon Falls; *Bailey* 232, Vermilion lake; *Herb. Sheld.* 1740, Minneapolis; *Herb. Moyer* 224, Carlton lake, Chippewa Co.

CORYLUS LINN. Gen. 730 (1737).

Baillon, *Hist. Pl.* VI, 255; Benth. and Hook., *Gen. Pl.* III, 406; Durand, *Ind. Gen. Phan.* 381; Engler and Prantl, *Nat. Pflanz.* 3, I, 43; Schenck, *Palaeophyt.* 422.

Living species: 7; Middle and S. Europe, the Orient, Central and E. Asia and N. Amer. Europe, 3; Russia, 1; Russian Europe, 1; N. America, 2; Atl. states, 2; Pac. states, 1; Asia, 4.

Fossil species: 13; Tertiary, N. Greenland, Spitzbergen, Shetland, Africa, Japan, Amurland, Himalayas, China, Saghalin, Grinnell-Land, Alaska, Wyoming, Nebraska (*Heer*, *Lesquereaux*, *Nathorst*, *Unger*, etc.); Quaternary—interglacial, Hanover.

***Corylus rostrata* AIT. Hort. Kew. III, 364 (1789).**

? *C. avellana* LED. Fl. Ross. III, 588 (1851) *in part*.

C. rostrata var. *mandschurica* REGEL, Veg. Amur. 489 (1858).

Wats. and Coult., Gray's Man. 6 ed. 474; Britt., Fl. N. J. 222; Mac., Fl. Can. I, 439; Chap., Fl. S. St. 425; Upham, Fl. Minn. 127; Coult., Fl.

Colo. 333; Wats., Fl. Calif. II, 101; Mac., Fl. Can. II, 355 in var.; Engl. Prantl, Nat. Pflanz. III, 1, 43.

N. Asia; sp. very closely related or identical.

North America: N. S., N. Br., Q., Ont. to Saskatchewan, Brit. Col. and Vancouver; S. to Washington and Colo.; E. to N. Eng., N. J. and Ga.

Minn. valley: Far N. W. district; local and rare; thickets and river banks.

HERB.: *Bailey* 229, Vermilion lake; *Roberts* 122, French river.

***Corylus americana* WALT.** Fl. Car. 236 (1788).

C. humilis WILLD. Berl. Baumz. 108 (1796).

Wats. and Coult., Gray's Man. 6 ed. 474; Britt., Fl. N. J. 222; Mac., Fl. Can. I, 440; Webb., Fl. Neb. 109; Upham, Fl. Minn. 127; Chap., Fl. S. St. 425; Cov., Fl. Ark. 220.

North America: Ont. to Man., Selkirks, Assiniboia and Cypress Hills; S. to N. Eng., N. J. and W. Fla.; W. to Dak., Neb. and Ark.

Minn. valley: Forest district; not infrequent; thickets and edges of woods.

HERB.: *Taylor* 378, Janesville; *Sheldon* 507, Waseca; *Taylor* 335, Janesville; *Sheldon* 324, Smith's Mills, Blue Earth Co.; *Sheldon* 467, Madison Lake, Blue Earth Co.; *Ballard* 228, Jordan, Scott Co.; *Oestlund* 176, Hennepin Co.; *Sandberg* 500, Goodhue Co.; *Oestlund* 177, Minneapolis.

BETULA LINN. Gen. 715 (1735) em. Gaert. (1791).

Betulaster SPACH, Ann. Sci. Nat. 2, XV, 198 (1841).

Baillon, *Hist. Pl.* VI, 254; Benth. and Hook., *Gen. Pl.* III, 404; Durand, *Ind. Gen. Phan.* 380; Engler and Prantl, *Nat. Pflanz.* 3. I, 43 (Prantl); Schenck, *Palaeophyt.* 409.

Living species: 35; boreal and temperate regions of N. hemisphere; Europe; Asia; N. America. 25 (B. and H.); Europe, 12; Russia, 11; N. America, 11; Canada, 9-10; S. Sts., 3; E. Sts., 7; Rocky mts., 2; Pl. King, 4; Pl. Wheel., 2; California, 2.

Fossil species: 40; doubtfully in the Cretaceous; abundant in Tertiary of polar regions and in Europe.

***Betula pumila* LINN.** Mant. I, 124 (1767).

B. grayi REGEL, Bull. Soc. Mosc. XVIII, 406 (1866).

Wats. and Coult., Gray's Man. 6 ed. 472; Britt., Fl. N. J. 221; Mac., Fl. Can. I, 437; Upham, Fl. Minn. 128; Engl. Prantl, Nat. Pflanz. III, 1, 45.

North America: Newf., Labr., Anticosti, N. S., N. Br.,

Q., Ont. to foot-hills of Rockies; S. to Conn. and N. J.; W. to Ind., Ills. and Minn.

Minn. valley: N. E., N. W. and N. districts; marshy meadows and bogs.

HERB.: *Taylor* 737, Glenwood; *Ballard* 145n, Chaska; *Ballard* 423, New Prague, Scott Co.; *Sandberg* 504, Chisago Co.; *Sandberg* 505, Goodhue Co.; *Herb. Sheld.* 1796, Minneapolis.

Betula nigra LINN. Spec. 982 (1753).

B. lanulosa MICHX. Fl. N. Am. II, 181 (1803).

B. rubra MICHX. Arb. II, 142 (1812).

B. angulata LODD. Cat. (1836).

Wats. and Coult., Gray's Man. 6 ed. 472; Britt., Fl. N. J. 221; Webb., Fl. Neb. 110; Upham, Fl. Minn. 128; Chap., Fl. S. St. 428; Cov., Fl. Ark. 220; Engl. Prantl, Nat. Pflanz. III, 1, 45.

North America: Mass. to N. J. and Fla.; W. to Minn., Neb., E. Kan. and Tex.

Minn. valley: Forest district to Blue Earth Co.; local and infrequent; river banks and lake shores.

HERB.: *Holzinger* 256, Winona Co.

Betula papyrifera MARSH. Arbust. Amer. 19 (1785).

B. papyracea AIT. Hort. Kew. III, 337 (1789).

B. grandis SCHRAD. Ind. Sem. Gött. 2 (1833).

B. canadensis LOUD. Cab. (1836).

B. latifolia TAUSCH, Flora XXI, 751 (1838).

Wats. and Coult., Gray's Man. 6 ed. 472; Mac., Fl. Can. I, 436; Upham, Fl. Minn. 128; Wats., King Exp. 323; Engl. Prantl, Nat. Pflanz. III, 1, 45; Webb., Appx. Neb. 26.

North America: Throughout Canada ("widest range of any Canadian tree"—*Macoun.*) to Arctic ocean; S. to N. Eng., N. Penn., N. Ills. and Minn., Dak. and N. Neb.

Minn. valley: Forest district to Renville Co.; rare and local S. W.; but abundant N. E. districts. Woodland along streams.

HERB.: *Ballard* 290n, Jordan, Scott Co.; *Herrick* 275, Minneapolis; *Sandberg* 503, Red Wing.

ALNUS GAERTN. Fruct. II, 54, t. 90 (1791).

Alnaster SPACH, Ann. Sci. Nat. 2, XV, 200 (1841).

Alnobetula SCHUR. Transsylv. 614 (1866).

Semidopsis ZUMAG. Fl. Ped. I, 249 (1849).

Clethropsis SPACH, Ann. Sci. Nat. 2, XV, 201 (1841).

Baillon, *Hist. Pl.* VI, 254; Benth. and Hook., *Gen. Pl.* III, 404; Durand, *Ind. Gen. Phan.* 380; Engler and Prantl, *Nat. Pflanz.* 3, 1, 45 (Prantl); Schenck, *Palaeophyt.* 414.

Living species: 14; Europe; Mid. and N. Asia; N. and S. America, extropical; S. Africa. Europe, 6; Russia, 4; Rus-

sian Europe, 3; Rocky mts., 3; E. Sts., 4; S. Sts., 2; Canada, 4-5; California, 4; Pl. King, 3; Pl. Wheel., 2; N. America, excl. Mexico, 8.

Fossil species: 30; Cretaceous; *Alnus* and *Alnites*, *Alnophyllum*, Nebraska and Colo. (*Lesquereux*); Tertiary, N. America (*Lesqr.*); Tertiary, polar regions (*Heer*); Europe, (*Saporta*, *Unger*); Quaternary and recent, Forest-bed of Cromer, etc.

***Alnus incana* (LINN.) WILLD.** Spec. IV, 333 (1805).

Betula incana LINN. f. Suppl. 417 (1781).

Alnus glauca MICHX. Hist. Arb. II, 322 (1812).

A. crispa PURSH, Fl. Am. 623 (1814) partly.

A. intermedia SCHRAD. Herb. Hort. Gött.

A. incana var. *vulgaris* SPACH, Ann. Sci. Nat. 2, XV, 206 (1841).

A. incana var. *glauca* GRAY, Man. ed. I, 423 (1848).

Wats. and Coult., Gray's Man. 6 ed, 473; Britt., Fl. N. J. 221; Wats., Fl. Calif. II, 81; Coult., Fl. Colo. 332; Webb., Fl. Neb. 109; Upham, Fl. Minn. 128; Miyabe, Fl. Kur. 259, in var.; Herd., Fl. Eur. Russ. 120; Wats., King Exp. 322; Roth., Wheel. Exp. 239; Engl. Prantl, Nat. Pflanz. 3, I, 46; Hart., Scand. Fl. I, 378; Rothr., Alask. 454.

Northern Europe and Asia to Yezo and Saghalin.

North America: Newf. throughout Can. to the Rocky mts.; S to Mass. and N. J.; W. to E. Neb., Minn., Dak. and Colo.; Oregon to Saskatchewan and S. in mts. to Nevada and Mexico; N. to Alaska.

Minn. valley: N. E., and probably N. W. districts; along streams and around marshes.

XXVI. FAGACEAE. Oak Family.

Endlicher, *Gen. Pl.* 274 (1840); Benth. and Hook., *Gen. Pl.* III, 403 (1880)—Tribus III, *Cupuliferae*; Baillon, *Hist. Pl.* VI, 227 (1877), *Castanea-ceae in part*; Prantl, Engler and Prantl, *Nat. Pflanz.* 3, I, 47 (1887).

Genera: 4; 3 distributional centers according to Prantl, (1) N. extratropical regions (***Fagus***, ***Castanea*** § ***Eucastanea***, ***Quercus***); (2) tropical Asia (***Quercus*** § ***Pasania***, ***Castanea*** § ***Castanopsis***); (3) Antartic S. America, New Zealand, S. Australia (***Nothofagus***).

Species: 350±, living; 200-225; fossil, Cretaceous, Tertiary and Recent.

***Quercus* LINN.** Gen. 726 (1737).

Cyclobalanus, ***Cyclobalanopsis***, ***Pasania* OERST.** Liebm. Chènes. Amer. Trop. 19, 20 (1837?).

***Synaedrys* LINDL.** Introd. ed. 2, 441 (1835).

***Lithocarpus* BLUME,** Fl. Jav. Cupul. 34, t. 20 (1832?).

Baillon, *Hist. Pl.* VI, 256; Benth. and Hook., *Gen. Pl.* III. 407; Durand, *Ind. Gen. Phan.* 381; Engler and Prantl, *Nat. Pflanz.* 3, I, 55 (Prantl); Schenck, *Palaeophyt.* 433.

Living species: $300 \pm$; 300 (B. and H.); temperate and tropical regions; especially Europe, tropical and West Asia; N. America; absent from S. America, S. Africa, Australia and Oceanica. Europe. 25; Russia, 10; tropical Asia, $150 \pm$; North America and Mexico, $100 \pm$; U. S. $50 \pm$; E. Sts., 19; S. Sts., 21; Canada, 12-13; California and Pac. U. S., 25; Pl. Wheel., 10; (see *W. Am. Oaks*, Kellogg, Greene and McDonald).

Fossil species: $200 \pm$ described; Lower Cretaceous, *Quercophyllum*, 2 sp. Potomac beds (*Fontaine*); Upper Cretaceous, Colo., Neb., Kan., Wyoming (*Lesquereaux*, Ward, *Newberry*, Heer); Tertiary, N. America, Australia, Sumatra, Java, Japan, Greenland, Alaska, Spitzbergen, France, Italy (*Saporta*, Heer, *Ettinghausen*, *Brongniart*, *Göppert*, *Unger*, *Nathorst*; *Lesquereaux*, etc.) Pliocene and Quaternary, Ohio, Italy, Japan (*Newberry*, *Göppert*, *Saporta*, *Nathorst*); Amber, Baltic region (*Conwentz*).

***Quercus velutina* LAM.** Enc. Meth. II, 721 (1789).

Q. discolor ARR. Hort. Kew. III, 358 (1789).

Q. tinctoria BARTR. Trav. 2 ed. 37 (1791).

Q. tinctoria var. *angulosa* MICHX. Fl. N. Am. II, 198 (1803)

Q. tinctoria var. *sinuosa* MICHX. Fl. N. Am. II, 198 (1803).

Q. coccinea var. *tinctoria* GRAY, Man. 5 ed. 454 (1868).

Wats. and Coult., Gray's Man. 6 ed. 477; Britt., Fl. N. J. 244; Mac., Fl. Can. I, 443; Upham, Fl. Minn. 126; Chap., Fl. S. St. 422; Cov., Fl. Ark. 221; Engl. Prantl, Nat. Pflanz. III, 1, 57.

North America: S. Maine, W. Ont. to Minn.; S. to N. J., Ga., Tex.; W. to Kan. and Ark.

Minn. valley: Forest district throughout; woods and hillsides.

HERB.: *Sheldon* 475, Madison Lake, Blue Earth Co.; *Taylor* 332, Janesville; *Ballard* 329n, Belle Plaine; *Sandberg* 499, Red Wing; *Holzinger* 254, Winona Co.

***Quercus rubra* LINN.** Spec. 996 (1753).

Q. ambigua MICHX. Am. Arb. II, 120 (1810).

Q. coccinea var. ? *rubra* SPACH, Veg. II, 165 (1834).

Q. rubra var. *runcinata* A. DC. Prodr. XVI, 2, 60 (1864).

Wats. and Coult., Gray's Man. 6 ed. 477; Britt., Fl. N. J. 224; Webb., Fl. Neb. 109; Upham, Fl. Minn. 127; Chap., Fl. S. St. 422; Mac., Fl. Can. I, 442; II, 356; Cov., Fl. Ark. 221; Engl. Prantl, Nat. Pflanz. III, 1, 56.

North America: Q., Ont. to height of land W. of L. Superior, at L. Namakeen; S. to N. J. and Fla.; W. to Minn., Neb., Kan., Mo. and Ark.

Minn. valley: S. E. districts; rare or doubtful; river banks and low woods.

Quercus muhlenbergii ENGELM. Trans. Acad. St. Louis, III, 591 (1877).

Wats. and Coult., Gray's Man. 6 ed. 478; Britt., Fl. N. J. 222; Webb., Fl. Neb. 109; Upham, Fl. Minn. 126; Cov., Fl. Ark. 220.

North America: Mass. to Del. and N. J.; S. to N. Alab.; W. to Minn., E. Neb. and Tex.

Minn. valley: Reported from the S. E. district; doubtful; no Minn. specimens seen.

Quercus macrocarpa MICHX. Hist. Chènes. 2, 3 (1801).

Q. olivaeformis MICHX. f. Hist. Arb. II, 32 (1810).

Q. obtusiloba var. *depressa* NUTT. Gen. II, 215 (1818).

Q. alba HOOK. Fl. Bor.-Am. II, 158 (1840) *in part.*

Q. stellata var. *depressa* A. DC. Prodr. XVI, 2, 23 (1864).

North America: N. Br., Q., Ont. to Man. and Assiniboia; S. to Mass. and Penn.; W. to Minn., Dak., Neb., Kan. and Ark.

Minn. valley: Throughout; hillsides, knolls and banks of lakes and streams.

HERB.: *Ballard* 408, Jordan, Scott Co.; *Taylor* 470, Janesville; *Taylor*, 692 Minnesota lake; *Sheldon* 474, Madison Lake; *Oestlund* 175, Hennepin Co.; *Sandberg* 498, Red Wing; *Bailey* 63, Vermilion lake; *Bailey* 534, Mud lake; *Herb. Wickersheim* 114, 115, Idlewild, Lincoln Co.; *Herb. Moyer* 223, Montevideo.

Quercus alba LINN. Spec. 996 (1753).

? *Q. sinuata* WALT. Fl. Car. 235 (1788).

Q. alba var. *pinnatifida* MICHX. Hist. Chènes. IV, 5 (1801).

Q. alba var. *repanda* MICHX. Hist. Chènes. IV, 5 (1801).

Q. microcarpa A. DC. Prodr. XVI, 2, 22 (1864)

Wats. and Coult., Gray's Man. 6 ed. 475; Britt., Fl. N. J. 222; Webb., Fl. Neb. 109; Upham, Fl. Minn. 126; Chap., Fl. S. St. 423; Mac., Fl. Can. I, 440; Wats., King Exp. 321; Cov., Fl. Ark. 220; Engl. Prantl, Nat. Pflanz. III, 1, 57.

North America: Q., Ont., Maine to N. J. and Fla.; W. to Dak., Neb., Kan. ? and Tex.

Minn. valley: S. E. district; wooded hills and banks.

HERB.: ? *Ballard* 485, Prior's lake, Scott Co.; *Holzinger* 253, Winona Bluffs.

XXVII. ULMACEAE. Elm Family.

Endlicher, *Gen. Pl.* 275 (1840) — *Ulmaceae* and *Celtideae*; Benth. and Hook., *Gen. Pl.* III, 343 (1880)—Trib. I, II, *Urticaceae*; Engler in *Engler and Prantl, Nat. Pflanz* 3, I, 59 (1887).

Genera: 13; tropical and extratropical.

Species: 125±; 50–60 fossil; Eocene to Recent.

ULMUS LINN. Gen. 194 (1737).

Chaetoptelea LIEBM. Vid. Med. Kiob. (1850).

Microptelea SPACH, Am. Sci. Nat. 2, XV, 358 (1841).

Baillon, *Hist. Pl.* VI, 184; Benth. and Hook., *Gen. Pl.* III, 351; Durand, *Ind. Gen. Phan.* 373; Engler and Prantl, *Nat. Pflanz.* 3, I, 62; Schenck, *Palaeophyt.* 470.

Living species: 16; temperate N. hemisphere; mts. in tropical Asia. Europe, 3; Russia, 8; Russian Europe, 7; S. Sts., 5; Rocky mts., 1; E. Sts., 4; Canada, 3; Pl. Wheel., 1; N. America, 6–7.

Fossil species: *Ulmiphyllum*, Lower Cretaceous (*Fontaine*)—Potomac river beds, 3 sp. *Ulmus*, 30–45 sp. described; Eocene, rare; Oligocene abundant—Grinnell-Land, Greenland, Saghalin, Japan, Switzerland, Alaska, Colorado (*Lesquereaux*, *Saporta*, *Heer*, *Unger*, *Watelet*, etc.).

Ulmus racemosa THOMAS, Am. Jour. Sci. Ser. 1, XIX, 170 (1831).

U. americana PLANCH. DC. Prodr. XVII, 155 (1873) *in part*.

Wats. and Coult., Gray's Man. 6 ed. 462; Britt., Fl. N. J. 216; Mac., Fl. Can. 428; Upham, Fl. Minn. 124.

North America: Q., Ont. to S. W. Vt. and N. J.; W. to Minn., Ky. and Mo.

Minn. valley: Forest district to Chippewa valley; infrequent or rare; woods and along streams.

HERB.: *Moyer* 220; Cedar lake, near Montevideo.

Ulmus americana LINN. Spec. 226 (1753).

U. mollifolia MARSH. Arbust. Amer. 156 (1785).

U. americana var. *pendula* AIT. Hort. Kew. I, 320 (1789).

U. pendula WILLD. Berl. Baumz. 519 (1796).

U. alba RAF. Fl. Lud. 115 (1817).

U. americana var. *scabra* SPACH, Ann. Sci. Nat. 2 ser. XV, 364 (1841).

U. americana var. *bartramii* WALP. Ann. III, 424 (1846?).

U. floridana CHAP. Fl. S. St. 416 (1860).

U. americana var. *aspera* CHAP. Fl. S. St. 416 (1860).

Wats. and Coult., Gray's Man. 6 ed. 462; Britt., Fl. N. J. 216; Webb., Fl. Neb. 111; Upham, Fl. Minn. 124; Mac., Fl. Can. I. 428; Coult., Fl. Colo. 329; Cov., Fl. Ark. 218; Engl., Nat. Pflanz. III, 1, 62.

North America: Cape Breton, N. S., N. Br., Q., Ont., L. Winnipeg to 52° N. lat. on Saskatchewan and L. Waswanapy, N. W. T.; S. to N. Eng., N. J. and Fla. and W. to Kan., Neb., Dak., Ark. and head waters of Missouri river.

Minn. valley: Throughout; abundant; rich woods and around lakes.

HERB.: *Sheldon* 1579, Lake Benton; *Sheldon* 380, Madison Lake, Blue Earth Co.; *Oestlund* 171, Hennepin Co.; *Sandberg* 493, Goodhue Co.; *Herb. Sheld.* 1908, Minneapolis; *Herb. Moyer* 219, Chippewa river, near Montevideo.

***Ulmus fulva* MICHX.** Fl. N. Am. I, 172 (1803).

U. americana LINN. Herb. Banks.

U. pubescens WALT. Fl. Car. 111 (1788).

U. americana var. *rubra* AIT. Hort. Kew. I, 319 (1789).

U. crispa WILLD. Enum. 295 (1809).

U. rubra MICHX. f. Sylv. III, 138 (1819).

Wats. and Coult., Gray's Man. 6 ed. 462; Britt., Fl. N. J. 216; Mac., Fl. Can. I, 427; Webb., Fl. Neb. 111; Chap., Fl. S. St. 416; Upham, Fl. Minn. 124; Roth., Wheel. Exp. 357; Cov., Fl. Ark. 218; Engl., Nat. Pflanz. III, 1, 62.

North America: Q., Ont., to Georgian bay; S. to N. Eng., N. J. and W. Fla.; W. to Dak., Neb., Kan., Ark.

Minn. valley: Forest district and W. at least to Pomme des Terres valley; along streams and in rich woods.

HERB.: *Taylor* 423, Janesville; *Sheldon* 286, Madison Lake, Blue Earth Co.; *Holzinger* 209, Winona. Co.; *Bailey* 237, Vermilion lake; *Holzinger* 210, Winona Co.; *Herb. Moyer* 218, Montevideo.

CELTIS LINN. Gen. 844 (1737).

***Solenostigma* ENDL.** Prodr. Norf. 41 (1833).

***Mertensia* H. B. K.** Nov. Gen. et. Spec. II, 30 (1817).

***Momisia* DUM.** An. Fam. 17 (1829).

Baillon, *Hist. Pl.* VI, 186; Benth. and Hook., *Gen. Pl.* III, 354; Durand, *Ind. Gen. Phan.* 373; Engler and Prantl, *Nat. Pflanz.* 3, I, 63; Schenck, *Palaeophyt.* 474.

Living species: 50; temperate regions, especially N. and in the tropics. Europe, 2; Russian Europe, 1; Tex. 4-5; Rocky mts., 1; E. Sts., 1; Canada, 1; S. Sts., 1; N. America, 5-6.

Fossil species: 12-15 described; Oligocene, Miocene, Atlantic America, Colorado, Japan, Germany (*Lesquereaux*, *Saporta*, *Göppert*).

***Celtis occidentalis* LINN.** Spec. ed. 2, 1478 (1762).

C. obliqua MOENCH, Meth. 344 (1794).

C. crassifolia LAM. Enc. Meth. IV, 138 (1797).

C. pumila PURSH, Fl. 200 (1814).

? *C. canina* RAF. Am. Mo. Mag. (1808?).

C. mississippiensis BOSC. Dict. Ag. n. ed. X, 41 (—).

C. alba DC. Prodr. XVII, 177 (1873).

Wats. and Coult., Gray's Man. 6 ed. 463; Britt., Fl. N. J. 216; Webb., Fl. Neb. 111; Upham, Fl. Minn. 124; Coult., Fl. Colo. 330; Mac., Fl. Can. I, 429; Chap., Fl. S. St. 417; Wats., King Exp. 321; Cov., Fl. Ark. 218; Engl., Nat. Pflanz. III, 1, 64.

Introduct. in Europe.

North America: Ont. to L. of Woods; S. to N. J. and Ga.; W. to Minn., Dak., Neb., Ark., Colo.

Minn. valley: Throughout; woodland and along streams or around lakes.

HERB.: *Taylor* 298, Janesville; *Sheldon* 1230, Iberia, Brown Co.; *Sheldon* 1416, Lake Benton; *Ballard* 388, Jordan, Scott Co.; *Sheldon* 465, Madison Lake; *Sheldon* 903, Sleepy Eye.

XXVIII. MORACEAE. Mulberry Family.

Endlicher, *Gen. Pl.* 277, 286 (1840); Benth. and Hook., *Gen. Pl.* III, 343 (1880);—Trib. IV, V, VI, *Urticaceae*; Engler in *Engler and Prantl*, *Nat. Pflanz.* 3, I, 66 (1888).

Genera: 55 living, 2–3 fossil; temperate and tropical regions; largely developed in tropical America.

Species: 900±; 66 per cent. in the tropical genus *Ficus*; fossil species of *Ficus* from Greenland to S. hemisphere, Cretaceous to Tertiary and Recent; numerous.

MORUS LINN. Gen. 711 (1737).

Baillon, *Hist. Pl.* VI, 190; Benth. and Hook., *Gen. Pl.* III, 364; Durand, *Ind. Gen. Phan.* 375; Engler and Prantl, *Nat. Pflanz.* 3, I, 72 (Engler); Schenck, *Palaeophyt.* 476.

Living species: 10±; temperate N. hemisphere and tropical mts. N. America, 5–6; Russian Europe, 1; Russia, 2; S. Sts., 2; Canada, and E. Sts., 1; Arizona, 1.

Fossil species: 1 sp. in Pliocene of Cantal (*Saporta*).

Morus rubra LINN. Spec. 986 (1753).

M. canadensis LAM. Enc. Meth. IV, 380 (1797).

M. scabra WILLD. Enum. 967 (1809).

M. rubra var. *canadensis* LOUD. Arb. III, 1360 (1838).

M. missouriensis AUDIB. Jard. Ton. (1853).

Wats. and Coult., Gray's Man. 6 ed. 464; Britt., Fl. N. J. 217; Mac., Fl. Can. I, 430; Webb., Fl. Neb. 111; Chap., Fl. S. St. 415; Upham, Fl. Minn. 124; Cov., Fl. Ark. 219; Engl., Nat. Pflanz. III, 1, 73.

North America: Around L. Erie in Can.; W. N. Eng. and N. J. to Fla.; W. to Minn., Dak., Neb., Kan. and to Mexico.

Minn. valley: Reported from S. E. district; rare or local; woods and along streams.

HUMULUS LINN. Gen. 750 (1737).**Lupulus** GAERTN. Fruct. I. 358 (1788).

Baillon, *Hist. Pl.* VI, 216; Benth. and Hook., *Gen. Pl.* III, 356; Durand, *Ind. Gen. Phan.* 374; Engler and Prantl, *Nat. Pflanz.* 3, I, 96 (Engler). Schenck, *Palaeophyt.* 476.

Living species: 2; N. temperate regions. 1, cosmopolitan; 1, China and Japan.

Fossil species: 2-3; Pliocene, France (*Saporta*).

Humulus lupulus LINN. Spec. 1457 (1753).*Cannabis lupulus* SCOP. Fl. Carn. II, 263 (1772).*Lupulus communis* GAERTN. Fruct. 75 (1788).*Humulus americanus* NUTT. Journ. Acad. Phil. V, 181 (1840).

Wats. and Coult., Gray's Man. 6 ed. 464; Britt., Fl. N. J. 216; Webb., Fl. Neb. 111; Mac., Fl. Can. I, 429; Upham, Fl. Minn. 125; Chap., Fl. S. St. 414; Coult., Fl. Colo. 331; Nym., Fl. Eur.; Hook., Fl. Gt. Brit. 363; Herd., Fl. Eur. Russ. 118; Wats., King Exp. 321; Roth., Wheel. Exp. 239; Cov., Fl. Ark. 219; Engl., Nat. Pflanz. III, 1, 97; Hart., Fl. Scand. I, 345.

North America: N. S., Q., Ont. to Man., 53° N. lat., Brit. Col.; S. to N. Mex. in mts.; E. across cont. to N. Eng. and Ga. Introd. in Atl. states?

Minn. valley: Throughout; climbing on underbrush or trees; banks of streams and edges of woods.

HERB.: *Sheldon* 1039, Sleepy Eye; *Ballard* 302n, Jordan, Scott Co.; *Kassube* 216, Minneapolis; *Sandberg* 496, Red Wing; *Sandberg* 497, Red Wing.

XXIX. URTICACEAE. Nettle Family.

Endlicher, *Gen. Pl.* 282 (1840); Benth. and Hook., *Gen. Pl.* III, 343 (1880)—Tribus VII, *Urticeae*; Engler in *Engler and Prantl, Nat. Pflanz.* 3, I, 98 (1888).

Genera: 41 living; 5 fossil; tropics and sparingly without; to Auckland Island and to 4500 m. in Himalayas and Andes.

Species: 500±; 33 per cent. New World; 33 per cent. Asia; 14 per cent. Africa; 14 per cent. Oceanica; 3-4 per cent. Europe (Engler). Fossil species, 12-15, Cretaceous and Tertiary.

URTICA LINN. Gen. 710 (1737).

Baillon, *Hist. Pl.* III, 517; Benth. and Hook., *Gen. Pl.* III, 381; Durand, *Ind. Gen. Phan.* 377; Engler and Prantl, *Nat. Pflanz.* 3, I, 104 (Engler); Schenck, *Palaeophyt.* 483.

Living species: 30±; temperate regions. Europe, 6; Russia, 5; Russian Europe, 2; N. America, 10±; Canada, 3; E. Sts., 2; Pl. King, 1; Pl. Wheel, 4; California, 4.

Fossil species: Miocene of Steirmack (*Ettinghausen*).

Urtica gracilis AIT. Hort. Kew. I, 341 (1789).*U. dioica* MICHX. Fl. N. Am. II, 112 (1803).*U. procera* PURSH, Fl. Am. I, 113 (1814).*U. dioica* var. *procera* WEDD. DC. Prodr. XVI, 1, 52 (1869).

Wats. and Coult., Gray's Man. 6 ed. 465; Britt., Fl. N. J. 217; Coult., Fl. Colo. 330; Mac., Fl. Can. I, 430; Webb., Fl. Neb. 111; Upham, Fl. Minn. 124; Chap., Fl. S. St. 412; Wats., King Exp. 321; Roth., Wheel. Exp. 238; Cov., Fl. Ark. 219; Rothr., Alask. 454?

North America: N. S. to Saskatchewan and Rockies; N. to Ft. Franklin on Mackenzie; S. to N. Eng., N. J., Ga.; W. to Colo., Neb. and Ark

Minn. valley: Throughout; abundant; banks of streams, edges of fields and moist banks.

HERB.: *Taylor* 841, Glenwood; *Taylor* 186, Janesville; *Taylor* 304, Janesville; *Ballard* 361, Helena, Scott Co.; *Sheldon* 362a, Elysian; *Sheldon* 834, Sleepy Eye; *Kassube* 214, Minneapolis; *Herrick* 270, Minneapolis; *Oestlund* 172, Minneapolis; *Bailey* 267, Vermilion lake; *Herb. Sheld.* 1700, Minneapolis; *Herb. Moyer* 221, Montevideo.

LAPORTEA GAUDICH. Freyc. Voy. Bot. 498 (1826).**Disocarpus** LIEBM. K. Dan. Vid. Sel. Schr. 5, II, 308 (1851).**Dendrocne** MIQ. Pl. Jungh. I, 29 (1851).**Selepsion** RAF. MSS. ex Baillon, l. c. (1872).**Urticastrum** MOEHR. Hort. Priv. (1736).

Baillon, *Hist. Pl.* III, 519; O. Kuntze, *Rev. Gen.* II, 634; Benth. and Hook., *Gen. Pl.* III, 383; Durand, *Ind. Gen. Phan.* 377; Engler and Prantl, *Nat. Pflanz.* 3, I, 106 (Engler).

Living species: 25; tropical regions and a few in extra-tropical N. America; S. Sts., 1; E. Sts., 1; Canada, 1; Rocky mts., 1; U. S., 1-2.

Laportea canadensis (LINN.) GAUDICH. Uran. 498 (1826).*Urtica canadensis* LINN. Spec. 1397 (1753).*U. divaricata* PURSH, Fl. Am. 113 (1814).*Selepsion divaricatum* RAF. MSS.*Urtica whitlowi* MUHL. Cat. (1818).*Fleurya canadensis* B. and H. Fl. Nig. 517 (1849).

Wats. and Coult., Gray's Man. 6 ed. 465; Britt., Fl. N. J. 218; Coult., Fl. Colo. 331; Mac., Fl. Can. 431; Webb., Fl. Neb. 111; Chap., Fl. S. St. 413; Upham, Fl. Minn. 124; Cov., Fl. Ark. 219; Engl., *Nat. Pflanz.* III, 1, 106.

North America: N. S., N. Br., Q., Ont. to Sault Ste. Marie; S. to N. J. and Fla.; W. to Kan., Neb. and Dak.

Minn. valley: Throughout; abundant; damp and rich woodland and shaded river banks.

HERB.: *Sheldon* 40, Elysian; *Sheldon* 460, Madison Lake, Blue Earth Co.; *Sheldon* 854, Sleepy Eye; *Ballard* 708,

Waconia; *Taylor 593a*, Minnesota lake; *Taylor 305*, Janesville; *Ballard 292*, Jordan, Scott Co.; *Taylor 811*, Glenwood; *Herrick 271*, Minneapolis; *Kassube 215*, Minneapolis; *Sandberg 494*, Vasa; *Herb. Moyer 222*, Chippewa river bottoms, near Montevideo.

ADICEA RAF. An. Nat. 129 (1815).

Pilea LINDL. Collect. t. 4 (1821).

Dubreueilia GAUDICH. Freyc. Voy. Bot. 495 (1826).

Adike RAF. N. Fl. 63 (1836).

Baillon, *Hist. Pl.* III, 524; Benth. and Hook., *Gen. Pl.* III, 384; Durand, *Ind. Gen. Phan.* 377; O. Kuntze, *Rev. Gen.* II, 621; Engler and Prantl, *Nat. Pflanz.* 3, I, 108 (Engler).

Living species: 100+; 160 (B. and H.); 175 (Durand); tropical regions, especially American; wanting in Australia. N. America, temperate regions, 2; Canada and E. Sts., 1.

Adicea pumila (LINN.) RAF. An. Nat. 179 (1815).

Urtica pumila LINN. Spec. 1395 (1753).

U. fasciculata POIR. Enc. Meth. IV, 640 (1797).

Dubreueilia pumila GAUDICH. Uran. 295 (1826).

Adike pumila RAF. N. Fl. 63 (1836).

Pilea pumila GRAY, Man. ed. 1, 437 (1848).

Wats. and Coult., Gray's Man. 6 ed. 466; Britt., Fl. N. J. 218; Mac., Fl. Can. 431; Webb., Fl. Neb. 111; Upham, Fl. Minn. 125; Chap., Fl. S. St. 413; Engl., *Nat. Pflanz.* III, 1, 108.

North America: N. B., Q., Ont. to Georgian Bay; S. to N. J. and Fla.; W. to Minn., Neb. and Kan.

Minn. valley: Forest district and N. W. district; moist woods and shaded banks.

HERB.: *Taylor 1129*, Glenwood; *Herrick 272*, Minnetonka; *Holzinger 211*, Winona; *Sandberg 495*, Goodhue Co.; *Sheldon 1625*, Taylor's Falls.

RAMIUM RUMPF. V. 214 (1747).

Boehmeria JACQ. Stirp. Amer. 246, t. 157 (17—).

Caturus LINN. Suppl. (1767) p. p. ex Kuntze l. c. (1891).

Splitgerbera MIQ. Comm. Phyt. 133 (1838-40).

Duretia GAUDICH. Freyc. Voy. Bot. 500, *adn.* (1826).

Baillon, *Hist. Pl.* III, 526; Benth. and Hook., *Gen. Pl.* III, 387; Durand, *Ind. Gen.* 378; O. Kuntze, *Rev. Gen.* II, 631; Engler and Prantl, *Nat. Pflanz.* 3, I, 111 (Engler).

Living species: 45±; mostly tropical—in N. America and E. Asia, extra-tropical; to Canada and Japan. N. America, 1 sp. in Atlantic region.

Ramium cylindricum (LINN.) OK. Rev. Gen. II, 632 (1891).

Urtica cylindrica LINN. Spec. 1396 (1753).

Boehmeria cylindrica WILLD. Spec. IV, 340 (1805).

B. lateriflora MUHL. Cat. (1813).

Urtica capitata PURSH, Fl. Am. 113 (1814).

Duretia cylindrica GAUDICH. Uran. 499 (1826).

Boehmeria cylindrica var. *B.* HOOK. Fl. Bor.-Am. II (1840).

Wats. and Coult., Gray's Man. 6 ed. 466; Britt., Fl. N. J. 218; Mac., Fl. Can. I, 432; Chap., Fl. S. St. 414; Upham, Fl. Minn. 125; Cov., Fl. Ark. 219; Engl., Nat. Pflanz. III, 1, 111.

North America: N. Eng., Ont. to Minn.; S. to N. J. and Fla.; W. to Dak. and Ark.

Minn. valley: Reported from N. W. district; infrequent or rare; moist woods and shaded river banks.

PARIETARIA LINN. Gen. 771 (1737).

Freiria and **Thaumuria** GAUDICH. Freyc. Voy. Bot. 502 (1826).

Gesnouinia GAUDICH. Freyc. Voy. Bot. 502 (1826).

Helxine REQ. Ann. Sci. Nat. 1, V, 384 (1824).

Soleirolia GAUDICH. l. c. (1826).

Baillon, *Hist. Pl.* III, 534; Benth. and Hook., *Gen. Pl.* III, 392, 393; Durand, *Ind. Gen. Phan.* 378; Engler and Prantl, *Nat. Pflanz.* 3, I, 115, 116 (Engler).

Living species: 9; temperate regions; scarce in tropics; N. America, 2; 1, Atl. region; 1, Pac. region.

Parietaria pensylvanica MUHL. Willd. Spec. IV, 955 (1805).

P. debilis var. *pensylvanica* WEDD. Monog. 516 (1856).

Wats. and Coult., Gray's Man. 6 ed. 466; Britt., Fl. N. J. 418; Mac., Fl. Can. I, 432; Upham, Fl. Minn. 125; Webb., Fl. Neb. 111; Wats., Fl. Calif. II, 65; Chap., Fl. S. St. 413; Coult., Fl. Colo. 331.

North America: Ont. to N. W. T., N. Brit. Col. and Rocky mts.; S. to Colo. and N. E. Nev.; E. across cont. to E. Mass., Vt. and Ga.

Minn. valley: Throughout; local; banks and edges of woods; not infrequent.

HERB.: *Taylor 413*, Buffalo lake, Waseca Co.; *Sheldon 792*, Sleepy Eye; *Ballard 407*, Jordan, Scott Co.; *Holzinger 212*, Winona Co.; *Holzinger 213*, Winona Co.; *Herrick 273*, Minneapolis; *Oestlund 173*, Minneapolis; *Oestlund 174*, Hennepin Co.

XXX. SANTALACEAE. Sandal-wood Family.

Endlicher, *Gen. Pl.* 324, 1378 (1840); Benth. and Hook., *Gen. Pl.* III, 217 (1880) excl. Tribus IV, *Grubbieae*; Hieronymus in Engler and Prantl, *Nat. Pflanz.* 3, I, 202 (1889).

Genera: 26 living; 1 fossil; tropical and temperate regions; distributional centers (1) S. Africa; (2) Malay Archipelago; (3) S. America and Australia; (4) N. temperate region; (Hieronymus).

Species: 250 ± living; 12-15 fossil; Tertiary.

COMANDRA NUTT. Gen. I, 157 (1818).**Hamiltonia** SPRENG. Syst. I, 831 (1825) p. p.Benth. and Hook., *Gen. Pl.* III, 224; Durand, *Ind. Gen. Phan.* 358; Engler and Prantl, *Nat. Pflanz.* 3, I, 221 (Hieronymus).

Living species: 4; Europe, 1; N. America, 3; Canada, 3; E. Sts., 3; S. Sts. 1; Rocky mts., 2; Pl. King, 1; Pl. Wheel., 2.

Comandra livida RICH. Appx. Frankl. Journ. 9 (1823).*Hamiltonia sarmentosa* SPRENG. Syst. I, 831 (1825).

Wats. and Coult., Gray's Man. 6 ed. 451; Mac., Fl. Can. I, 423; Upham, Fl. Minn. 122.

North America: Newf. and Labrador, N. S., N. Br., L. Nipigon, L. Winnipeg to Rocky mts., Brit. Col., 69° N. lat. and Arctic circle; S. to N. Vt., Wisc. and Minn.

Minn. valley: Reported from N. edge; doubtful; dry hillsides or banks.

Comandra umbellata (LINN.) NUTT. Gen. I, 157 (1818).*Thesium umbellatum* LINN. Spec. 302 (1753).*T. corymbulosum* MICHX. Fl. N. Am. I, 112 (1803).*Hamiltonia umbellata* SPRENG. Syst. I, 831 (1825).

Wats. and Coult., Gray's Man. 6 ed. 450; Britt., Fl. N. J. 214; Webb., Fl. Neb. 133; Mac., Fl. Can. I, 423; Chap., Fl. S. St. 396; Coult., Fl. Colo. 324; Wats., King Exp. 319; Roth., Wheel. Exp. 254; Cov., Fl. Ark. 217.

North America: Cape Breton, Q., Ont. to Owen Sound, L. Huron, Saskatchewan (N. of 51° lat.) and Rockies; S. to Washington and Californian Sierras; E. across cont. to N. Eng., N. J. and Ga.

Minn. valley: Forest district and perhaps throughout; dry ground or edges of meadows.

HERB.: *Sheldon* 1168, New Ulm; *Holzinger* 202, Winona, Co.; *Kassube* 212, Minneapolis; *Sandberg* 487, Goodhue Co.; *Holzinger* 203, Stockton; *Herb. Sheld.* 1861, Ramsey Co.; 1718, Minneapolis.**Comandra pallida** A. DC. Prodr. XIV, 636 (1856).

Wats. and Coult., Gray's Man. 6 ed. 450; Webb., Fl. Neb. 133; Mac., Fl. Can. I, 423; Coult., Fl. Colo. 324; Wats., King Exp. 319; Roth., Wheel. Exp. 254 in var.

North America: Saskatchewan and N. W. T. to Brit. Col. and Oregon; S. to Minn., Neb., Kan., N. Mex., and W. to Rocky mts.

Minn. valley: Reported from W. N. W. edge; doubtful or rare; dry shaded hills.

XXXI. ARISTOLOCHIACEAE. Birthwort Family.

Endlicher, *Gen. Pl.* 344 (1840); Benth. and Hook., *Gen. Pl.* III, 121 (1880); Solereder in *Engler and Prantl, Nat. Pflanz.* 3, I, 264 (1889).

Genera: 5; warmer and tropical regions; principally S. America, and absent from Australia. Doubtful remains in Cretaceous and Tertiary.

Species: 200; 90 per cent. in genus *Aristolochia* of the tropical and subtropical regions.

ASARUM LINN. Gen. 385 (1737).

Heterotropa MORR. and DECNE. *Ann. Sci. Nat.* II, 2, 314 (1834).

Baillon, *Hist. Pl.* IX, 21; Benth. and Hook., *Gen. Pl.* III, 122; Durand, *Ind. Gen. Phan.* 345; Engler and Prantl, *Nat. Pflanz.* 3, I, 271 (Solereder); Schenck, *Palaeophyt.* 707.

Living species: 13; temperate regions, N. hemisphere; Europe, 1; Himalayas, 1; Japan, 7; North America, 4; E. Sts., 3; Canada, 2; S. Sts., 3; California, 3.

Fossil species: Cretaceous of Nebraska and Europe?

Asarum canadense LINN. Spec. ed. 2, 633 (1762).

A. carolinianum WALT. Fl. Car. 143 (1788).

A. latifolium SALISB. Prodr. 344 (1796).

A. villosum MUHL. Cat. (1813).

Wats. and Coult., Gray's Man. 6 ed. 445; Britt., Fl. N. J. 212; Mac., Fl. Can. I, 418; Upham, Fl. Minn. 116; Chap., Fl. S. St. 371; Cov., Fl. Ark. 216; Engl. Solereder. *Nat. Pflanz.* III, 1, 271.

North America: N. Br., Q., Ont. to 49° N. lat. in Man. and Saskatchewan; S. to N. Eng., N. J., N. Car. and W. to Minn. and Dak.

Minn valley: Throughout; shaded river banks and moist woodland.

HERB.: *Sheldon* 146, Madison Lake; *Ballard* 52n, Chaska; *Holzinger* 193, Winona Co.; *Kassube* 206, Minneapolis; *Arthur* 159, Vermilion lake; *Leonard* 42, Minneapolis; *Winchell* 19, Minneapolis; *Sandberg* 475, Goodhue Co.; *Herb. Sheld.* 1875, Ramsey Co.; *Herb. Wickersheim* 110, Idlewild, Lincoln Co.

ARISTOLOCHIA LINN. Gen. 639 (1737).

Glossula RAF. ex. Baillon. l. c. (1888).

Pistolochia RAF. ex. Baillon, l. c. (1888).

? **Endodeca** RAF. ex. Baillon, l. c. (1888).

Howardia and **Einomenia** KLOTZSCH, *Monatb. Berl.* 607 (1859).

Siphisia RAF. Med. Fl. I, 62 (1828).

Hocquartia DUM. *Comm. Bot.* 30 (1822).

Holostylis DUCHARTRE. *Ann. Sci. Nat.* 4, II, 33 (1855).

Guaco LIEBM. *Forh. Scand. Nat.* 203 (1844).

Baillon, *Hist. Pl.* IX, 22; Benth. and Hook., *Gen. Pl.* III. 123; Durand, *Ind. Gen. Phan.* 345; Engler and Prantl, *Nat. Pflanz.* 3, I, 272 (Solereder); Schenck, *Palaeophyt.* 704-709.

Living species: $180 \pm$; tropical and temperate regions. Europe, 13; Russia, 2; S. Sts., 4; E. Sts., 3; Calif., 1. The section which is represented in Asia and N. America contains 14 sps.

Fossil species: 15-20; Cretaceous and Tertiary, Nebraska (*Heer*); Greenland (*Heer*); Europe (*Saporta*); *Aristolochiaephyllum* in Lower Cretaceous, Potomac group (*Fontaine*) 1 sp.

***Aristolochia siphon* L'HER.** Stirp. Nov. Fasc. I, 13 (1784).

A. macrophylla LAM. Enc. Meth. I, 252 (1783).

Siphisia glabra RAF. Med. Fl. I. 65 (1828).

S. siphon KLOTZSCH, Monatsber. 602 (1859).

Wats. and Coult., Gray's Man. 6 ed. 445; Chap., Fl. S. St. 372; Upham, Fl. Minn. 116; Engl. Solered. Nat. Pflanz. III, 1, 272.

North America: Penn. to Minn. and Kan.

Minn. valley: Reported from N. E. district and S. E. edge; rare or local; rich woods and moist river banks.

XXXII. POLYGONACEAE. Buckwheat Family.

Endlicher, *Gen. Pl.* 304 (1840); Benth. and Hook., *Gen. Pl.* III, 89 (1880); Dammer in Engler and Prantl, *Nat. Pflanz.* 3, I a, 1 (1891).

Genera: 30; cosmopolitan; arborescent forms principally in tropical America; herbaceous in temperate regions; shrubby in E. Mediterranean and Inland-sea region of Asia, (*Bentham* and *Hooker*). Center of distr. N. temperate zone (*Dammer*).

Species: 650-700 living; 12-15 fossil.

RUMEX LINN. Gen. 300 (1737).

***Lapathum* MOENCH,** Meth. 355 (1794).

***Acetosa* NECK.** Elem. II, 214 (1790).

Benth. and Hook., *Gen. Pl.* III, 100; Durand, *Ind. Gen. Phan.* 342; Engler and Prantl, *Nat. Pflanz.* 3, I a, 17 (Dammer).

Living species: 150 described; $100 \pm$ reduced; cosmopolitan, but largely predominant in N. hemisphere. Europe, 36; Russia, 32; Russian Europe, 20; S. Sts., 9; Rocky mts., 5; California, 12-13; Canada, 8; E. Sts., 7; Pl. King, 8?; Pl. Wheel., 3; N. America, 17-20.

***Rumex verticillatus* LINN.** Spec. 334 (1753).

Wats. and Coult., Gray's Man. 6 ed. 438; Upham, Fl. Minn. 120; Mac., Fl. Can. I, 416; Chap., Fl. S. St. 385; Cov., Fl. Ark. 216; Trelease, Rev. Rum. 85.

North America: N. S.?, Q., Ont., N. Eng. to N. J. and Fla.; W. to Minn., Mo. and Tex.

Minn. valley: Forest district; swamps and wet woodland or meadow.

HERB.: *Holzinger* 201, Winona Co.?; *Oestlund* 164, Minneapolis.

***Rumex altissimus* WOOD, Proc. Am. Acad. 177 (1853).**

R. britannica MEISSN. DC. Prodr. XIV, 47 (1852).

Wats. and Coult., Gray's Man. 6 ed. 438; Britt., Fl. N. J. 211; Upham, Fl. Minn. 120; Webb., Fl. Neb. 111; Trelease, Rev. Rum. 86.

North America: N. Y. to N. J.; W. to Minn., Neb. and Kan.; Dak. to Tex.

Minn. valley: Forest district; habitat like that of *R. britannicus* LINN.

HERB.: *Taylor* 180, Janesville; *Sheldon* 1067, Springfield; *Ballard* 27, Chaska.

***Rumex britannicus* LINN. Spec. 334 (1753).**

R. xanthorhizos HOFFM. Nachtr. 239, ex. *Shultes*.

R. orbiculatus GRAY, Man. 5 ed. (1868).

Wats. and Coult., Gray's Man. 6 ed. 438; Britt., Fl. N. J. 211; Mac., Fl. Can. I, 415, II, 354; Upham, Fl. Minn. 120; Wats., King Exp. 314; Webb., Appx. Neb. 27; Engl. Dammer, Nat. Pflanz. 3, I a, 18; Trelease, Rev. Rum. 87.

North America: N. Br., Q., Ont. to Kaministiquia river, Owen Sound and 64° N. lat. in N. W. T.; S. to N. Eng., N. J. and Del.; W. to Minn., Dak. and Kan.; S. in Rockies to Nev.; Alaska to Mexico,

Minn. valley: Forest and N. W. district; W. to Chippewa valley or beyond; moist grounds and meadows.

HERB.: *Taylor* 1162a, Glenwood; *Taylor* 992, Glenwood; *Ballard* 327, Belle Plaine; *Roberts* 120, Stewart river; *Bailey* 328, St. Louis river; *Kassube* 210, Minneapolis.

***Rumex salicifolius* WEINMANN, Flora IV, 28 (1821).**

R. verticillatus RICH. Appx. 11 (1823).

Wats. and Coult., Gray's Man. 6 ed. 438; Mac., Fl. Can. I, 416; Webb., Fl. Neb. 112; Upham, Fl. Minn. 120; Coult., Fl. Colo. 317; Wats., Fl. Calif. II, 8; Led., Fl. Ross. III, 504; Trautv., Fl. Sib. 98; Wats., King Exp. 314; Roth., Wheel. Exp. 231; Rothr., Alask. 453; Trelease, Rev. Rum. 87; Greene, Fl. Fran. 139.

Arctic Siberia.

North America: Newf. N. Br., Q. to L. Nipigon, Man., L. Winnipeg, Souris Plain, Great Bear lake, Mackenzie river and Alaska; W. to Rocky mts.; S. to Calif., Colo., Neb., Iowa, Gt. Lake region and N. Eng.

Minn. valley: Throughout; prairie district, saline or alkaline marshes.

HERB.: *Sheldon* 1569, Lake Benton; *Ballard* 286, Jordan, Scott Co.; *Herrick* 261, Minneapolis; *Bailey* 1, Vermilion lake; *Herrick* 262, Minneapolis; *Hammond* 36, Lake City; *Herb. Moyer* 216, Montevideo.

Rumex persicarioides LINN. Spec. 335 (1753).

R. anthoxanthum MURR. Prodr. Gött. 52 (1770).

R. aureus WITH. Arr. 356 (1776).

R. maritimus Auct. Amer.

Wats. and Coult., Gray's Man. 6 ed. 439; Britt., Fl. N. J. 211; Webb., Fl. Neb. 112; Mac., Fl. Can. I, 417; Upham, Fl. Minn. 121; Chap., Fl. S. St. 386; Coult., Fl. Colo. 318; Wats. Fl. Calif. II, 9; Hook., Fl. Gt. Brit. 348; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 110; Wats., King Exp. 314; Cov., Fl. Ark. 216; Led., Fl. Ross. III, 500; Hart., Fl. Scand. I, 338; Trelease, Rev. Rum. 93; Greene, Fl. Fran. 139.

Europe: Scand. and Brit. to Servia and Mid. Russ.

North America: N. Br., Ont., Man., Saskatchewan to Hudson Bay and Rocky mts.; S., E. of Sierras, to N. Mex., and E. to Atl. coast and N. Car.

Minn. valley: Throughout; marshy or alkaline and saline localities.

HERB.: *Sheldon* 1252, Lake Benton; *Sheldon* 758, Sleepy Eye; *Ballard* 654, Chaska; *Ballard* 500, Prior's lake, Scott Co.; *Taylor* 653, Minnesota lake; *Oestlund* 165, Minneapolis; *Kassube*, 211, Minneapolis; *Herrick* 263, Minneapolis; *Leiberg* 52, Blue Earth Co.

POLYGONUM LINN. Gen. ed. V. 445 (1754).

Tephis ADANS. Fam. II, 276 (1763).

Lagunea LOUR. Fl. Cochinch. 220 (1790).

Tovara ADANS. Fam. II, 276 (1763).

Antenoron RAF. Fl. Lud. 28 (1817).

Ampelygonum LINDL. Bot. Reg. (1838).

Echinocaulos HASSK. Flora (1842).

Chylocalyx HASSK. MSS.

Thysanella A. GRAY, Bost. Journ. Nat. Hist. V, 232 (1847).

Bilderdykia DUMORT, Flor. Belg. 18 (1827).

Pleuropterus TURCZ. Bull. Imp. Soc. Mosc. 587 (1848).

Benth. and Hook., Gen. Pl. III; Durand, Ind. Gen. Phan. 342; Schenck, Palaeophyt. 490-491; Engl.-Damm., Nat. Pflanz. 3, I a, 25.

Living species: 150; cosmopolitan; N. rather than S. Europe, 31; Russia, 31; Russian Europe, 22; S. Sts., 18; Rocky mts., 16; Canada, 29-31; California, 25; E. Sts., 21; Pl. King, 11-12; Pl. Wheel., 11; N. America and Mexico, 50±.

Fossil species: Tertiary, Spitzbergen (*Heer*); Oen-

ingen (*Heer*); Amber (Baltic Sea—*Conwentz.*); Quaternary or Pliocene, Japan (*Nathorst*); 6 or 7 sp. See also *Saporta*.

Polygonum acre HBK. N. Gen. et. Spec. II, 179 (1817).

P. hydropiperoides PURSH, Fl. Am. 270 (1814).

P. hydropiper MICHX. Fl. N. Am. I, 238 (1803).

P. punctatum ELL. Sk. I, 455 (1824).

Wats. and Coult., Gray's Man. 6 ed. 442; Britt., Fl. N. J. 209; Mac., Fl. Can. I, 411; Webb., Fl. Neb. 112; Upham, Fl. Minn. 119; Chap., Fl. S. St. 389; Cov., Fl. Ark. 215; Engl.-Damm., Nat. Pfl. 3, I a, 38; Greene, Fl. Fran. 136.

North America: Ont. and N. Eng. to Minn., Dak. and Neb.; S. to Fla., Mo. and Ark.

Minn. valley: N. E. district; wet places, around lakes and pools.

HERB.: *Bailey* 370, Mud river; *Holzinger* 197, Winona Co.

Polygonum hydropiper LINN. Spec. 517 (1753).

P. glandulosum POIR. Enc. Meth. VI, 149 (1804).

P. mite ELL. Sk. I (1821).

Wats. and Coult., Gray's Man. 6 ed. 441; Britt., Fl. N. J. 209; Mac., Fl. Can. I, 411; Webb., Fl. Neb. 112; Upham, Fl. Minn. 119; Coult., Fl. Colo. 320; Led., Fl. Ross. III, 523; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 112; Chap., Suppl. S. St. 645; Roth., Wheel. Exp. 232; Hart., Fl. Scand. I, 333; Engl.-Damm., Nat. Pflanz. 3, I a, 28.

All Europe; Arctic Russia to Caucasus, Siberia and Dahuria.

North America: Atl. to Pac. in Can.; S. to Minn., Neb. and Mo.; introd. E. of Mississippi valley; S. to N. Ga.

Minn. valley: Throughout: wet ground; shores of lakes and streams.

HERB.: *Sheldon* 1477, Pipestone City; *Taylor* 1153, Glenwood; *Ballard* 604, Prior lake, Scott Co.; *Ballard* 661, Waconia; *Taylor* 828, Glenwood; *Ballard* 722, Benton, Carver Co.; *Ballard* 849, Patterson lake, Carver Co.; *Roberts* 114, Duluth; *Roberts* 115, Stewart river; *Sandberg* 481, Red Wing.

Polygonum hydropiperoides MICHX. Fl. N. Am. I, 239 (1803).

P. mite PURSH, Fl. Am. 270 (1814).

P. persoonii ENGELM. in Herb. Ledebour.

Wats. and Coult., Gray's Man. 6 ed. 441; Britt., Fl. N. J. 209; Mac., Fl. Can. I, 411; Chap. Fl. S. St. 389; Upham, Fl. Minn. 119; Cov., Fl. Ark. 216; Webb., Appx. Neb. 27; Engl.-Damm., Nat. Pfl. 3, I a, 28.

S. America and Australia.

North America: N. Br., Ont., N. Eng. to N. J. and Fla.; W. to Minn., Neb., Mo. and Ark.

Minn. valley: Throughout; wet places, edges of pools and lakes, in the water.

HERB.: *Sheldon* 881, Sleepy Eye; *Herrick* 257, Minneapolis; *Herrick* 258, Minneapolis; *Oestlund* 159, Hennepin Co.; *Oestlund* 160, Hennepin Co.; *Herb. Sheld.* 1674, Minneapolis.

***Polygonum hartwrightii* GRAY**, Proc. Am. Acad. VIII, 294 (1870).

Wats. and Coult., Gray's Man. 6 ed. 441; Britt., Fl. N. J. 209; Webb., Fl. Neb. 112; Mac., Fl. Can. I, 410; Wats., Fl. Calif. II, 14; Upham, Fl. Minn. 119; Coult., Fl. Colo. 320; Greene, Fl. Fran. 136.

North America: Anticosti, Ont. to Hudson Bay and Owen Sound; S. to N. Eng. and N. J.; W. to Minn., Iowa, Neb., Utah, California and Pac. coast.

Minn. valley: Throughout; moist banks and shores and around pools.

HERB.: *Taylor* 224, Janesville; *Sheldon* 648, Waseca; *Sheldon* 988, Sleepy Eye; *Oestlund* 161, Hennepin Co.; *Bailey* 417, Long lake.

***Polygonum emersum* (MICHX.) BRITT.** Cat. N. J. 209 (1890).

P. bistorta WALT. Fl. Gar. 131 (1788) *not* Linn.

P. amphibium var. *terrestre* WILLD. Spec. II (1799).

P. amphibium emersum MICHX. Fl. N. Am. I, 240 (1803).

P. coccineum terrestre MUHL. Cat. 40 (1813).

P. amphibium var. (?) *muhlenbergii* MEISN. Mon. Polyg. (1856).

P. muhlenbergii S. WATS. Proc. Am. Acad. Sci. XIV (1879).

P. terrestre B. S. P. Cat. N. Y. (1888).

Wats. and Coult., Gray's Man. 6 ed. 441; Britt., Fl. N. J. 209; Upham, Fl. Minn. 119; Mac., Fl. Can. I, 410; Wats., Fl. Calif. II, 13; Coult., Fl. Colo. 320; Mac., Fl. Can. II, 353; Roth., Wheel. Exp. 232; Webb., Appx. Neb. 27; Greene, Fl. Fran. 137.

North America: Prairie regions of Can. to Saskatchewan and Brit. Col.; S. to N. Eng., Fla. and Miss.; W. to Washington, Oregon, Calif. and Tex.

Minn. valley: Throughout; wet places; sandy beaches and shores of streams.

HERB.: *Sheldon* 1192, New Ulm; *Sheldon* 1396, Lake Benton; *Taylor* 1073, Glenwood; *Leiberg* 56, Blue Earth Co.; *Herrick* 259, Minneapolis; *Bailey* 366, Mud river; *Sandberg* 482, Red Wing; *Herb. Moyer* 214, 215, Chippewa river, near Montevideo.

***Polygonum amphibium* LINN.** Spec. 361 (1753).

P. purpureum GILIB. Exerc. Phyt. II, 433 (1792).

P. amphibium var. *aquaticum* WILLD. Spec. II, (1799).

P. coccineum MUHL. Cat. 40 (1813).

Persicaria amphibia S. F. GRAY, Arr. II, 268 (1821).

Wats. and Coult., Gray's Man. 6 ed. 440; Britt., Fl. N. J. 209; Mac., Fl. Can. I, 410; Upham, Fl. Minn. 119; Webb., Fl. Neb. 112; Wats., Fl. Calif. II, 13; Coult., Fl. Colo. 320; Miyabe., Fl. Kur. 257; Led., Fl. Ross. III, 520; Nym., Fl. Eur.; Trautv., Fl. Sib. 100; Hook., Fl. Gt. Brit. 344; Herd., Fl. Eur. Russ. 112; Wats., King Exp. 316; Roth., Wheel. Exp. 232; Cov., Fl. Ark. 215; Hart., Fl. Scand. I, 332; Engl. Damm., Nat. Pflanz. 3, I a. 28; Greene, Fl. Fran. 137.

Most Europe to Siberia, Dahuria, China, Japan, Kurile Isls. and Saghalin; W. Himalayas; S. Africa.

North America: Q., Ont. to Brit. Col. and Pac. S., E. of Sierras, to Mexico and E. to Atlantic.

Minn. valley: Forest district and far N. W.; aquatic; floating in quiet waters.

HERB.: *Leonard 43*, Crystal lake.

***Polygonum pensylvanicum* LINN. Spec. 361 (1753).**

P. scabrum MOENCH, Suppl. 267 (1802).

? *P. bicornne* RAF. Fl. Lud. 29 (1817).

Wats. and Coult., Gray's Man. 6 ed. 440; Britt., Fl. N. J. 208; Upham, Fl. Minn. 119; Webb., Fl. Neb. 112; Coult., Fl. Colo. 319; Chap., Fl. S. St. 388; Wats., Fl. Calif. II, 13; Mac., Fl. Can. I, 409.

North America: N. S., N. Br., Q., Ont. to Minn., Dak., Neb., Colo. and Sonora, Calif.; E. to N. Eng. and N. J.; S. to Ga. and Ark.

Minn. valley: Throughout; moist soil, river banks, barren shores of lakes and sloughs.

HERB.: *Sheldon 1047*, Sleepy Eye; *Taylor 829*, Glenwood; *Ballard 613*, Chaska; *Ballard 622*, Chaska; *Ballard 848*, Patterson lake, Carver Co.; *Ballard 803*, Goose lake, Carver Co.; *Ballard 660*, Waconia; *Ballard 879*, Waconia; *Ballard 742*, Waconia; *Ballard 504*, Prior's lake, Scott Co.; *Oestlund 156*, Minneapolis; *Sandberg 480*, Cannon Falls; *Huntington 13*, Rock Co.; *Herb. Sheld. 1675*, Minneapolis; *Herb. Wickersheim 111*, Lake Park, Becker Co.

***Polygonum incarnatum* ELL. Sk. I, 456 (1821).**

P. nodosum var. *incarnatum* GRAY, Man. 3 ed. 372 (1852).

P. lapathifolium var. *incarnatum* WATS. and COULT. Gray's Man. 6 ed. 440 (1890).

Mac., Fl. Can. I, 409; Upham, Fl. Minn. 119; Britt., Fl. N. J. 209; Webb., Fl. Neb. 112; Chap., Fl. S. St. 388; Coult., Fl. Colo. 319; Mac., Fl. Can. II, 353; Led., Fl. Ross. III, 521; Nym., Fl. Eur., *in var.*; Hook., Fl. Gt. Brit. *in var.* 344; Cov., Fl. Ark. 216; Webb., Appx. Neb. 27.

All Europe; N. Russia to Ural Siberia—in vars.

North America: N. S., N. Br., Ont., L. Nipigon to Vancouver; S. to N. J. and S. Car.; W. to Minn., Dak., Neb., Ark., Mo.

Minn. valley: Throughout; wet places; meadows, banks of streams and shores of lakes.

HERB.: *Sheldon* 15, Elysian; *Ballard* 784, Swan lake, Carver Co.; *Oestlund* 157, Minneapolis; *Oestlund* 158, Hennepin Co.; *Winchell* 20, Minneapolis; *Herb. Moyer* 213, Montevideo.

Polygonum tenue MICHX. Fl. N. Am. I, 238 (1803).

P. linifolium Muhl. Cat. 40 (1813).

P. filiforme BART. Comp. Fl. Phil. I, 186 (1818).

Wats. and Coult., Gray's Man. 6 ed. 440; Britt., Fl. N. J. 210; Mac., Fl. Can. I, 408; Upham, Fl. Minn. 120; Webb., Fl. Neb. 112; Chap., Fl. S. St. 390; Coult., Fl. Colo. 319; Wats., Fl. Calif. II, 12; Wats., King. Exp. 315; Roth., Wheel. Exp. 331; Cov., Fl. Ark. 216.

North America: Ont., Saskatchewan, Souris plain, Brit. Col. and Pac. coast; S. in Sierras to Calif., Neb. and Arizona; E. across cont. to N. Eng., and N. Car.

Minn. valley: Reported from W. edge and S. W. district; infrequent; knolls and barren bluffs.

Polygonum ramosissimum MICHX. Fl. N. Am. I, 237 (1803).

Wats. and Coult., Gray's Man. 6 ed. 440; Britt., Fl. N. J. 210; Mac., Fl. Can. I, 408; Webb., Fl. Neb. 112; Wats., Fl. Calif. II, 12; Upham, Fl. Minn. 120; Coult., Fl. Colo. 319; Wats., King Exp. 315.

North America: Ont. to L. Winnipeg, Rocky mts. and valley of the Columbia; S. to lower Sierra Nevada; E. across Cont. to Neb., Minn., Mo., N. Eng. and N. J.

Minn. valley: Prairie district. throughout; dry or sandy waste places.

HERB.: *Taglor* 1147, Glenwood; *Sheldon* 1499, Lake Benton; *Oestlund* 162, Minneapolis; *Holzinger* 199, Winona Co.; *Sandberg* 483, Red Wing; *Holzinger* 200, Winona.

Polygonum erectum LINN. Spec. 361 (1753).

P. aviculare var. *erectum* GRAY, Man. 4 ed. 417 (1867).

Wats. and Coult., Gray's Man. 6 ed. 440; Britt., Fl. N. J. 210; Mac., Fl. Can. I, 407; Upham, Fl. Minn. 120; Webb., Fl. Neb. 112; Coult., Fl. Colo. 318; Chap., Fl. S. St. 390; Wats., Fl. Calif. II, 11; Led., Fl. Ross. III, 532; Roth., Wheel. Exp. 231; Cov. Fl. Ark. 215

All Russia.

North America: Ont. to Rocky mts.; S. and W. to Oregon, Nev. and Calif.; E. through Colo. and Neb. to N. Eng., N. J. and Ga.

Minn. valley: Forest district and doubtless throughout; shaded banks or woodland districts.

HERB.: *Sheldon* 1729, Minneapolis.

Polygonum aviculare LINN. Spec 362 (1753).*P. centinodium* LAM. Fl. Fr. III, 237 (1793).*P. geniculatum* POIR. Enc. Meth. VI, 147 (1804).*P. provinciale* KOCH, Linn. XXII, 204 (1848).

Wats. and Coult., Gray's Man. 6 ed. 439; Britt., Fl. N. J. 210; Upham, Fl. Minn. 119; Mac., Fl. Can. I, 407; Webb., Fl. Neb. 112; Coult., Fl. Colo. 318; Chap., Fl. S. St. 390; Brew. and Wats., Fl. Calif. II, 11; Miyabe., Fl. Kur. 257; Led., Fl. Ross. III, 531; Nym., Fl. Eur.; Trautv. Fl. Sib. 101; Hook., Fl. Gt. Brit. 346; Herd., Fl. Eur. Russ. 112; Roth., Wheel. Exp. 5, 230, 373; Wats., King Exp. 315; Cov., Fl. Ark. 215; Hart, Fl. Scand. I, 333; Engl. Damm. Nat. Pflanz. 3, I, a, 29; Rothr., Alask. 453; Greene, Fl. Fran. 133.

All Europe; all Russia and Siberia to Japan and Kurile Isls.

North America: Greenland to Alaska and S. to Calif. and Ga.; indigenous west of the Mississippi.

Minn. valley: Throughout; door yards, roadsides, fields and banks.

HERB.: *Sheldon* 1558, Lake Benton; *Sheldon* 1011, Sleepy Eye; *Ballard* 524, Cleary's lake, Scott Co.; *Sandberg* 482, Red Wing; *Roberts* 116, Grand Marais; *Kassube* 208, Minneapolis; *Holzinger* 198, Winona Co.; *Herb. Sheld.* 1670, Minneapolis; *Herb. Wickersheim* 112, Idlewild, Lincoln Co.

Polygonum virginianum LINN. Spec. 360 (1753).*P. muticum* MOENCH, Suppl. 266 (1802).*Persicaria virginiana* GAERTN. Fruct. II, 180 (1791).? *Antenoron racemosum* RAF. Fl. Lud. 28 (1817).

Wats. and Coult., Gray's Man. 6 ed. 442; Britt., Fl. N. J. 209; Webb., Fl. Neb. 112; Mac., Fl. Can. I, 413; Upham, Fl. Minn. 119; Chap., Fl. S. St. 390; Cov., Fl. Ark. 216; Engl.-Damm., Nat. Pfl. 3, I a, 28.

North America: N. S. to Ont.; S. to Fla.; W. to Minn., Neb., Ark. and Mo.

Minn. valley: S. central district; thickets and moist woodland.

HERB.: *Sheldon* 298, Madison Lake, Blue Earth Co.

Polygonum articulatum LINN. Spec. 361 (1753).*Polygonella articulata* MEISN. Gen. II, 228 (1843).

Wats. and Coult., Gray's Man. 6 ed. 443; Britt., Fl. N. J. 210; Upham, Fl. Minn. 119; Mac., Fl. Can. 409; Cov., Fl. Ark. 215.

North America: Sault Ste. Marie and N. Superior region to Saskatchewan; S. to Maine, N. J. and Minn.; S. to Mo. and Ark.

Minn. valley: Reported from S. central district; infrequent or local; dry and sandy soil.

Polygonum scandens LINN. Spec. 363 (1753).*P. dumetorum* var. *scandens* GRAY, Man. 5 ed. 418 (1868).

Wats. and Coult., Gray's Man. 6 ed. 443; Britt., Fl. N. J. 210; Mac., Fl. Can. I, 413; Webb., Fl. Neb. 112; Chap., Fl. S. St. 391; Upham, Fl. Minn. 120; Wats., Fl. Calif. II, 15; Coult., Fl. Colo. 321; Led., Fl. Ross. III, 528; Nym., Fl. Eur.; Hook., Fl. Gt. Brit.; Herd., Fl. Eur. Russ. 112; Cov., Fl. Ark. 215.

Europe, Asia and India—with *P. dumetorum* Linn.

North America: N. S., N. Br., Q., Ont.; N. Superior region to N. W. T.; S. to Washington and Montana to Colo.; E. to N. Eng., N. J., Fla. and Miss.

Minn. valley: Throughout; moist thickets and edges of woods or along shaded banks.

HERB.: *Taylor* 1163, Glenwood; *Sheldon* 1563, Lake Benton; *Sheldon* 427, Ash lake, Blue Earth Co.; *Ballard* 506, Prior's lake, Scott Co.; *Ballard* 630, Chaska; *Leiberg* 57, Blue Earth Co.; *Bailey* 51, Vermilion lake; *Herb. Sheld.* 1793, Minneapolis.

Polygonum cilinode MICHX. Fl. N. Am. I, 241 (1803).

Wats. and Coult., Gray's Man. 6 ed. 442; Britt., Fl. N. J. 210; Mac., Fl. Can. I, 413; Chap., Fl. S. St. 391; Upham, Fl. Minn. 120.

North America: N. S., N. Br., Q., Ont., Hudson Bay and Peace river valley to N. Eng., N. J., N. Car., and W. to Mich. and Minn.

Minn. valley: N. E. district and N. edge; rare or local; rocky hills and banks.

HERB.: *Roberts* 118, Grand Marais; *Roberts* 119, Duluth; *Sandberg* 484, Vermilion lake.

Polygonum arifolium LINN. Spec. 362 (1753).

Wats. and Coult., Gray's Man. 6 ed. 442; Britt., Fl. N. J. 210; Mac., Fl. Can. I, 413; Chap., Fl. S. St. 390; Upham, Fl. Minn. 120; Engl.-Damm., Nat. Pflanz. 3, I a, 28.

Asia?

North America: N. S., N. Br., Q., Ont.; S. to N. Eng., N. J. and S. Car.; W. to Minn. and Mo.

Minn. valley: Forest district; Blue Earth Co.; rare; low, wet woodland.

HERB.: *Boden* 2, Chisago Co.

Polygonum sagittatum LINN. Spec. 363 (1753).*P. sagittatum* var. *boreale* MEISN. Mon. Polyg. 65 (1826).

Wats. and Coult., Gray's Man. 6 ed. 442; Britt., Fl. N. J. 210; Upham, Fl. Minn. 120; Mac., Fl. Can. I, 413; Webb., Fl. Neb. 112; Chap., Fl. S. St. 390; Led., Fl. Ross. III, 529; Cov., Fl. Ark. 216; Engl.-Damm., Nat. Pflanz. 3, I a, 28.

Asia; Siberia—Baikal and Transbaikal.

North America: Newf., N. S., N. Br., Q., Ont. to Saskatchewan and Minn.; S. to Fla., Ark., Kan., Neb. and Dak.

Minn. valley: Forest district to Cottonwood valley; infrequent W.; abundant E.; low places and thickets.

HERB.: *Sheldon* 209, Lake Washington, Blue Earth Co.; *Ballard* 657, Waconia; *Sheldon* 209a, Madison Lake, Blue Earth Co.; *Ballard* 498, Prior's lake, Scott Co.; *Ballard* 538, Cleary's lake, Scott Co.; *Ballard* 723, Benton, Carver Co.; *Roberts* 117, Stewart river; *Kassube* 209, Minneapolis; *Herrick* 260, Minneapolis; *Cestlund* 163, Minneapolis.

XXXIII. CHENOPODIACEAE. Goosefoot Family.

Endlicher, *Gen. Pl.* 292 (1840); Benth. and Hook., *Gen. Pl.* III, 43 (1880); Moquin-Tandon, *DC. Prodr.* xiii, II, 41 (1849)—*Salsolaceae*; Volkers in *Engler and Prantl, Nat. Pflanz.* 3, I a, 36 (1892).

Genera: 80; cosmopolitan; many of them composed of halophytes or xerophytes; few in tropics or polar regions.

Species: 550±; many widely distributed.

CHENOPODIUM LINN. Gen. 191 (1737).

Oligandra LESS. Linn. IX, 199 (1835).

Lipandra MOQ. Chen. En. 19 (1840).

Gandriloa STEUD. Nom. ed. 2 (1841).

Oliganthera ENDL. Gen. Suppl. I, 1377 (1843).

Ambrina SPACH, Suit. Buff. V, 295 (1836).

Botrydium SPACH, Suit. Buff. V, 298 (1836).

Teloxys MOQ. Ann. Sci. Nat. 2, I, 129 (1834).

Blitum LINN. Gen. 14 (1737).

Morocarpus MOENCH, Meth. 342 (1794).

Oxybasis KAR. and KIR. Bull. Imp. Soc. Mosc. 738 (1841).

Agathophyton MOQ. Ann. Sci. Nat. 2, I, 191 (1834).

Orthosporum NEES, Gen. Germ. Monochl. n 58 (1835).

Baillon, *Hist. Pl.* IX, 166; Benth. and Hook., *Gen. Pl.* III, 51; Durand, *Ind. Gen. Phan.* 336; Schenck, *Palaeophyt.* 491.

Living species: 50; cosmopolitan; Europe, 13; Russia, 15; Russian Europe, 12; California, 11–13; E. Sts., 5; Canada, 5; Rocky mts., 8; S. Sts., 2; Pl. King, 4; Pl. Wheel., 6; interior regions, 8–9.

Chenopodium rubrum LINN. Spec. 219 (1753).

Blitum maritimum NUTT. Gen. Add. (1818).

B. rubrum REICHB. Fl. Germ. Exc. 582 (1832).

B. polymorphum C. A. MEY. Fl. Alt. I, 13 (1829).

Wats. and Coult., Gray's Man. 6 ed. 432; Mac., Fl. Can. I, 400; Britt., Fl. N. J. 207; Upham, Fl. Minn. 117 and Suppl. Minn. 86; Coult., Fl. Colo.

308; Wats., King Exp. 288; Wats., Fl. Calif. II, 48; Hook., Fl. Gt. Brit 338.

Europe.

North America: Newf. to Assiniboia and Brit. Col.; S. to N. J. and W. to Minn., Colo. and Calif.

Minn. valley: S. W. and W. district; low or dry ground; saline localities.

HERB.: *Sheldon 1361*, Lake Benton; *Sheldon 1057*, Sleepy Eye lake.

Chenopodium boscianum MOQ. Chen. Enum. 21 (1840).

C. album Bosc. in Herb. Ventenat.

Wats. and Coult., Gray's Man. 6 ed. 431; Britt., Fl. N. J. 206; Upham, Fl. Minn. 117; Chap., Fl. S. St. 376; Cov., Fl. Ark. 215; Webb., Appx. Neb. 28.

North America: N. Y. and N. J. to S. Car.; W. to Minn., Neb., Ark. and Tex

Minn. valley: Blue Earth Co. and Lincoln Co.; prairie district S. and S. W.; sandy or gravelly places.

HERB.: *Sheldon 1555*, Lake Benton.

Chenopodium capitatum (LINN.) B. and H. Gen. l. c. (1880).

Blitum capitatum LINN. Spec. 6 (1753).

Morocarpus capitatus MOENCH, Meth. 342 (1794).

Blitum virgatum var. *capitatum* Coss. Germ. and Wedd. Pl. Par. 108 (1845).

Wats. and Coult., Gray's Man. 6 ed. 432; Britt., Fl. N. J. 207; Wats., Fl. Calif. II, 48; Mac., Fl. Can. I, 400; Upham, Fl. Minn. 117; Coult., Fl. Colo. 308; Nym., Fl. Eur.

Central Europe; Siberia.

North America: Atl. to Pac. in Can.; N. to Slave lake and Alaska; S. to Washington, Utah, New Mex., Minn., Neb. and Tex.; introd. in E. U. S.

Minn. valley: Reported from N. edge; infrequent; dry or waste places.

HERB.: *Holzinger 195*, Winona Co.; *Roberts 110*, Minnesota Point; *Roberts 111*, Duluth.

CORISPERMUM LINN. Gen. ed. V, 12 (1754).

Baillon, *Hist. Pl.* IX, 175; Benth. and Hook., *Gen. Pl.* III, 57; Durand, *Ind. Gen. Phan.* 337.

Living species: 5-6 (Baillon); 8-10 (Durand); Described, 15; S. Europe, C. and W. Asia to China; N. America. Russian Europe, 6; N. America, 1.

Corispermum hyssopifolium LINN. Spec. 6 (1753).

C. squarrosum VAHL, Enum. I, 16 (1804).

C. patens FISCH. in R. and S. Syst. I, 579 (1820).

Wats. and Coult., Gray's Man. 6 ed. 434; Wats., Fl. Calif. II, 57; Upham, Fl. Minn. 117; Webb., Fl. Neb. 113; Coult., Fl. Colo. 311; Mac., Fl. Can. I, 403; II, 352; Forbes and Hems., Fl. Sin. 326; Herd., Fl. Eur. Ross. 108; Wats., King Exp. 293; Roth., Wheel. Exp. 238; Cov., Fl. Ark. 215; Led., Fl. Ross III, 759; Rothr., Alask. 455.

S. Europe to Caucasus, N. W. India, Manchuria and China.

North America: Ont. and Gt. Lake region to Red, Saskatchewan and Athabasca valleys; Gt. Slave lake, N. W. T., Alaska to Pt. Barrow; S. to Minn., Neb., Ark., Colo.; Rockies from Brit. Col. to Sierras and Mexico; E. to Ills.

Minn. valley: N. E. and N. W. districts; local and infrequent; sandy beaches of lakes and along streams.

HERB.: *Taylor* 1187, Glenwood; *Roberts* 113, Minnesota Point.

SALSOLA LINN. Gen. 193 (1737).

Caroxylon THUNB. Pl. Nov. Gen. II, 37 (1782).

Halothamnus JAUB. and SPACH, Ill. Or. t. 136 (1844).

Benth. and Hook., *Gen. Pl.* III, 71; Baillon, *Hist. Pl.* IX, 186; Durand, *Ind. Gen. Phan.* 338.

Living species: 40±; temperate and subtropical regions. N. America, 1, Atl. states.

Salsola kali LINN. Spec. 222 (1753).

S. caroliniana WALT. Fl. Car. (1788).

S. carolina MICHX. Fl. Am. I, 174 (1803).

S. kali var. *caroliniana* NUTT. Gen. I, 199 (1818).

Wats. and Coult., Gray's Man. 6 ed. 435; Mac., Fl. Can. I, 405; Britt., Fl. N. J. 208; Webb., Fl. Neb. 113; Herd., Fl. Eur. Russ. 110; Nym., Fl. Eur.; Hook., Fl. Gt. Brit. 343.

Cosmopolitan species.

North America: N. S. and N. Br. to N. Eng. and Va.; W. to Minn. and Neb.

Minn. valley: W. and N. W. districts; saline or alkaline places; commonly confounded with *Corispermum*.

HERB.: *Sheldon* 1196, New Ulm; *Taylor* 1180, Glenwood.

XXXIV. AMARANTACEAE. Amaranth Family.

Endlicher, *Gen. Pl.* 300 (1840); Benth. and Hook., *Gen. Pl.* III, 20 (1880).

Genera: 50; temperate and warmer regions.

Species: 500; many cosmopolitan.

ACNIDE LINN. Gen. ed. V, 987 (1754).

Montelia A. GRAY, Man. ed. 2, 369 (1852).

Baillon, *Hist. Pl.* IX, 200 (sub *Amarantus*); Benth. and Hook., *Gen. Pl.* III, 29; Durand, *Ind. Gen. Phan.* 334.

Living species: 4-5; N. America to Trinidad. S. Sts., 4; E. Sts., 3; Rocky mts., 1; Canada, 2.

Acnide tamariscina (NUTT.) WOOD, Bot. 289 (1874).

Amarantus tamariscinus NUTT. Trans. Am. Phil. Soc. V, 165 (1837).

Acnida tuberculata, rusocarpa and *cannabina* var. *concatenata* MOQ.-TAND. DC. Prodr. xiii, II, 277, 278 (1849).

Montelia tamariscina var. *concatenata* GRAY, Man. ed. IV, 413 (1858).

Wats. and Coult., Gray's Man. 6 ed. 429; Upham, Fl. Minn. 118; Mac., Fl. Can. I, 397; Webb., Fl. Neb. 114; Coult., Fl. Colo. 305; Cov., Fl. Ark. 214.

North America: Ont. to Ohio, Alabama and La.; W. to Minn., Dak., Neb., Ark. and Mo.

Minn. valley: S. central and S. E. districts; gravelly or sandy shores.

HERB.: *Sandberg* 478, Red Wing; *Holzinger* 196, Winona.

FROELICHIA MOENCH, Meth. 50 (1794).

Oplotheca NUTT. Gen. II, 78 (1818).

Hoplotheca SPRENG. Syst. Cur. Post. 52 (1827).

Baillon, *Hist. Pl.* IX, 212; Benth. and Hook., *Gen. Pl.* III, 41; Durand, *Ind. Gen. Phan.* 335.

Living species: 10; America, warmer regions; Minn. to Brazil. S. Sts., 1; Rocky mts., 1; E. Sts., 2; Pl. Wheel., 1; N. Amer. excl. Mex., 4.

Froelichia floridana (NUTT.) MOQ. DC. Prodr. XIII, 2, 420 (1849).

Oplotheca floridana NUTT. Gen. II, 78 (1818).

Gomphrema floridana SPRENG. Syst. I, 824 (1825).

Wats. and Coult., Gray's Man. 6 ed. 430; Coult., Fl. Colo. 305; Upham, Fl. Minn. 118; Webb., Fl. Neb. 114; Chap., Fl. S. St. 384; Roth., Wheel. Exp. 234; Cov., Fl. Ark. 214.

North America: S. Minn. to Colo., Neb., Ark., Tex., Fla., Ga., Ills. and Wisc.

Minn. valley: Reported from N. E. district; infrequent; dry places.

HERB.: *Sandberg* 479, Goodhue Co.

AMARANTHUS LINN. Gen. 716 (1737).

Amblogyne RAF. Fl. Tell. 42 (1836).

Roemeria MOENCH, Meth. 351 (1794).

Sarratia MOQ.-TAND. DC. Prodr. xiii, II, 255 (1849).

Glomeraria COV. Leccion, 319 (1802).

Pyxidium MOENCH, Meth. 358 (1794).

Euxolus RAF. Fl. Tell. 42 (1836).

Pentreas RAF. l. c. (1836).

Albersia KUNTH, Fl. Berol. ed. 2, 144 (1838).

Mengea SCHAUER, Pl. Meyen 405 (1842?).

Scleropus SCHRAD. Ind. Gött. (1835).

Baillon, *Hist. Pl.* IX, 200, part; Benth. and Hook., *Gen. Pl.* III, 28; Durand, *Ind. Gen. Phan.* 333.

Living species: 50±; all warmer and tropical regions. Europe, 8; Russia, 8; Russian Europe, 7; North America, 15; S. Sts., 4; E. Sts., 3; Rocky mts., 5; California, 9; Pl. Wheel., 6; Pl. King, 3; Canada, 5—introduced.

Amaranthus blitoides S. WATS. Proc. Am. Acad. XII, 273 (1878).

Wats. and Coult., Gray's Man. 6 ed. 428; Webb., Fl. Neb. 114; Mac, Fl. Can. I, 397; Coult., Fl. Colo. 305; Wats., Fl. Calif. II, 41; Upham, Fl. Minn. 118; Greene, Fl. Fran. 163.

North America: Mex. to N. Nev., Iowa and Minn.; naturalized in Ont. and on Pac. coast.

Minn. valley: W. districts and E. to Mankato; roadsides and waste places.

HERB.: *Sheldon 1541*, Lake Benton; *Taylor 877*, Glenwood.

XXXV. PHYTOLACCACEAE. Pokeweed Family.

Endlicher, *Gen. Pl.* 310 (1840); Benth. and Hook., *Gen. Pl.* I, 858 (1865); III, 78 (1880); Heimerl, Engler and Prantl, *Nat. Pflanz.* 3, I b, 1 (1889).

Genera: 23; tropical and warmer regions. 50 per cent. tropical American.

Species: 85±; principally in the tropics.

PHYTOLACCA LINN. Gen. 384 (1737).

Phytolaca and **Sarcoca** RAF. Fl. Tell. 627 (1836).

Pircunia Moq. DC. Prodr. XIII, II, 29 (1849).

Baillon, *Hist. Pl.* IV, 50; Benth. and Hook., *Gen. Pl.* III, 84; Durand, *Ind. Gen. Phan.* 340; Engler and Prantl, *Nat. Pflanz.* 3, I b, 16 (Heimerl).

Living species: 11; widely distributed, but absent from Australia. America, 6; Old World, 5; U. S., 1; Europe and Russia, 1.

Phytolacca decandra LINN. Spec. 631 (1753).

Wats. and Coult., Gray's Man. 6 ed. 436; Britt., Fl. N. J. 208; Upham, Fl. Minn. 116; Chap., Fl. S. St. 375; Webb., Fl. Neb. 114; Nym., Fl. Eur.; Mac., Fl. Can. I, 405; Cov., Fl. Ark. 215; Engl. Heimerl, *Nat. Pflanz.* III, 1, 8-10.

S. Europe; China?

North America: Ont. and N. Eng. to Minn.; S. to Fla.; W. to Dak.? Neb. and Ark.

Minn. valley: Forest district to Blue Earth Co.; infrequent; low grounds.

HERB.: *Taylor 552*, Janesville.

XXXVI. NYCTAGINACEAE. Four-o'Clock Family.

Endlicher, *Gen. Pl.* 310 (1840); Benth. and Hook., *Gen. Pl.* III, 1 (1880); Heimerl, in *Engler and Prantl, Nat. Pflanz.* 3, I b, 14 (1889).

Genera: 15-16; tropical and warmer regions; principally America; rare in Australia and almost wanting in Africa.

Species: 160±; principally in tropical America.

MIRABILIS LINN. *Gen.* 139 (1737).

Admirabilis CLUS. *Hist.* II. 87 (1601).

Nyctago JUSS. *Gen.* 90 (1789).

Jalapa MOENCH, *Meth.* 508 (1794).

Quamoclidion CHOIS. *Prodr.* 429 n. 2 (1849?).

Acleisanthes A. GRAY, *Brief. Char. Am. Jour. Sci.* (II) XV, (—).

? **Nyctaginea** CHOIS. *Mem. Gen.* XII (1839).

Pentacophrys A. GRAY, *Brief. Char. Am. Jour. Sci.* (II) XV, (—).

Oxybaphus L'HER. ex Vahl. *Enum.* II, 39 (1806).

Allionia LOEFFL. *It.* 181 (1758).

Calyxhymenia ORTEG. *Dec.* 5, t. 1 (1800).

Calymenia PERS. *Syn.* I, 36 (1805).

Vitmannia TURRA, ex Cav. *Ic.* III, add. (1794).

Palavia and **Bruguiera** CAV. l. c. (1794).

Baillon, *Hist. Pl.* IV, 18, 19; Benth. and Hook., *Gen. Pl.* III, 3, 4; Durand, *Ind. Gen. Phan.* 331; Engler and Prantl, *Nat. Pflanz.* 3, I b, 24, 25; (Heimerl); Schenck, *Palaeophyt.* 491.

Living species: 30; mostly W. and S. W. N. America, Central America and Chile; 14-15, N. America and Mexico. E. Sts., Canada, and S. Sts., 3; 1 sp. in Himalayas.

Fossil species: Doubtful; 1-2 Gen. *Nyctaginaceae* in Oligocene and Miocene of W. N. America and Bohemia.

Mirabilis angustifolius (NUTT.).

Calymenia angustifolia NUTT. *Fras. Cat.* (1813).

Allionia linearis PURSH, *Fl. Am.* I, 729 (1814).

Oxybaphus angustifolius SWEET, *Hort. Brit.* 567 (1827).

Calyxhymenia pilosa ENGELM. and GRAY, *Pl. Lindh.* 293 (1845).

Wats. and Coult., *Gray's Man.* 6 ed. 425; Webb., *Fl. Neb.* 114; Coult., *Fl. Colo.* 302; Upham, *Fl. Minn.* 116; Mac., *Fl. Can.* I, 395; Wats., *King. Exp.* 284, 475; Roth., *Wheel. Ex.* 226; Cov., *Fl. Ark.* 214.

North America: Milk river, Cyprus hills, 49° N. lat. to Minn., Neb. and Tex.; E. to Iowa, W. to Cent. Idaho.

Minn. valley: N. E. and N. W districts; probably almost throughout; dry or rocky ridges.

HERB.: ? *Oestlund* 155, Minneapolis; ? *Herrick* 256, Minneapolis.

Mirabilis hirsutus (PURSH).

Allionia hirsuta PURSH, Fl. Am. 729 (1814).

Calymenia hirsuta NUTT. Gen. I, 26 (1818).

Oxybaphus hirsutus SWEET, Hort. Brit. 567 (1827).

Wats. and Coult., Gray's Man. 6 ed. 425; Mac., Fl. Can. I, 395; Webb., Fl. Neb. 114; Upham, Fl. Minn. 116; Coult., Fl. Colo. 302; Wats., King. Exp. 475; Roth., Wheel. Exp. 226.

North America: N. Saskatchewan and Assiniboia to Colo., Neb., W. Tex., Ark. and Wisc.

Minn. valley: Throughout; abundant in prairie district; rocky or dry banks.

HERB.: *Taylor* 870, Glenwood; *Sheldon* 1342, Lake Benton; *Taylor* 139, Glenwood; *Sheldon* 1446, Pipestone—dwarf forma *minima*; *Ballard* 376, Jordan; *Herrick* 257, Minneapolis; *Oestlund* 254, Minneapolis; *Sandberg* 477, Red Wing; *Herb. Moyer* 212, Montevideo.

Mirabilis nyctagineus (MICHX.).

Allionia nyctaginea MICHX. Fl. I, 100 (1803).

Oxybaphus nyctagineus SWEET, Hort. Brit. 537 (1827).

Wats. and Coult., Gray's Man. 6 ed. 425; Upham, Fl. Minn. 116; Mac., Fl. Can. I, 395; Webb., Fl. Neb. 114; Coult., Fl. Colo. 302; Roth., Wheel. Exp. 226; Wats., King. Exp. 475; Cov., Fl. Ark. 214.

North America: Souris river and Lake of Woods, Man.; S. to Mont., Tex. and N. Mex.; E. to Wisc., Neb., Ark. and La.

Minn. valley: Throughout; rocky or waste hillsides and shaded banks.

HERB.: *Ballard* 370, Helena, Scott Co.; *Taylor* 592, Minnesota lake; *Ballard* 762, Waconia; *Sheldon* 1107, Springfield; *Sheldon* 366, Madison Lake; *Taylor* 340, Janesville; *Sheldon* 1577, Lake Benton; *Oestlund* 153, Minneapolis; *Holzinger* 194, Winona Co.; *Herrick* 256, Minneapolis; *Kassube* 972, Mendota; *Sandberg* 476, Cannon Falls; *Herb. Sheld.* 1743, Minneapolis; *Herb. Moyer* 211, Montevideo.

XXXVII. PORTULACACEAE. Portulaca Family.

Endlicher, *Gen. Pl.* 946 (1840); Benth. and Hook. *Gen. Pl.* I, 155 (1865); Pax, in *Engler and Prantl, Nat. Pflanz* 3, I b, 51 (1889).

Genera: 17; *Talinum* and *Portulaca* are in all tropical and subtropical regions; other genera less widely distributed; found in temperate and tropical regions of both hemispheres.

Species: 150±; principally in temperate regions approaching the tropics.

TALINUM ADANS. Fam. Pl. II, 245 (1763).

Phemeranthus RAF. Specch. I, 56 (1814).

? *Eutmon* RAF. Atl. Journ. V, 23 (1820?).

Baillon, *Hist. Pl.* IX, 68; Benth. and Hook., *Gen. Pl.* I, 157; Durand, *Ind. Gen. Phan.* 31; Engler and Prantl, *Nat. Pflanz.* 3, I b, 56; Gray, *Ill. Gen.* I, 225.

Living species: 15+; Cape of Good Hope, 1; trop. Africa, 3; the rest in tropical and warmer America; N. America, 8; W. Tex., 4-5; S. Sts., 1; Rocky mts., 1; E. Sts., 1; Pl. King, 1; Pl. Wheel., 3-4.

Talinum teretifolium PURSH, Fl. Am. 365 (1814).

Phemeranthus teretifolius RAF. Specch. I, 86 (1814).

Talinum ciliatum WALP. Rep. II, 934 (1843).

Wats. and Coult., Gray's Man. 6 ed. 91; Coult., Fl. Colo. 37; Webb., Fl. Neb. 115; Upham, Fl. Minn. 33; Chap., Fl. S. St. 44; Engl. Pax, Nat. Pflanz. III, 1, 56; Cov., Fl. Ark. 169; Wats., Bibl. Ind. I, 121.

North America: Penn. to N. Car.; W. to Ind., Minn., Neb., Colo. and Ark.

Minn. valley: New Ulm to Ortonville; edges of gneiss, syenite or quartzite rock; especially in bed of the Warren.

HERB.: *Sheldon* 1446, Pipestone City; *Sheldon* 1200, Redstone, near New Ulm; *Herb. Moyer* 41, Montevideo.

CLAYTONIA LINN. Gen. 849 (1737).

Limnia LINN. Act. Ups. 130 (1746).

Baillon, *Hist. Pl.* IX, 68; Benth. and Hook., *Gen. Pl.* I, 158; Durand, *Ind. Gen. Phan.* 31; Engler and Prantl, *Nat. Pflanz.* 3, I b, 57 (Pax); Gray, *Ill. Gen.* 223; O. Kuntze, *Rev. Gen.* I, 56.

Living species: 20±; Arctic regions in N. Hemisphere; especially W. and N. in America and E. in Siberia; possibly 1 sp. in Australia and New Zealand. Russia, 11; N. America, 16-17; Calif., 13; Canada, 15-16; E. Sts., 2; Rocky mts., 5-6; S. Sts., 2; Pl. King, 5; Pl. Wheel., 5; Central Calif., 8.

Claytonia virginica LINN. Spec. 204 (1753).

C. acutiflora SWEET, Hort. Brit. 2 ed. (1830).

C. grandiflora SWEET, Brit. Fl. Gard. 2 ser. 216 (1831-1838).

Wats. and Coult., Gray's Man. 6 ed. 91; Britt., Fl. N. J. 66; Upham, Fl. Minn. 34; Webb., Fl. Neb. 115; Chap., Fl. S. St. 44; Wats., Bibl. Ind. I, 119; Mac., Fl. Can. I, 82; Engl. Pax, Nat. Pflanz. III, 1, 57; Cov., Fl. Ark. 169; Rothr., Alask. 446.

North America: N. S., N. Br., Ont., Man., Saskatchewan to Alaska; S. to N. Eng., N. J., N. Car.; W. to Ohio, Minn., Neb., Mo. and Ark.

Minn. valley: Forest district; Ft. Snelling to Blue Earth Co.; damp woodland and in open groves.

HERB.: *Sandberg* 99, Goodhue Co.; *Leiberg* 13, Blue Earth Co.; *Leiberg* 14, Blue Earth Co.; *Herb. Sheld.* 1872, St. Paul; *Herb. Wickersheim* 25, Mankato.

PORTULACA LINN. Gen. 341 (1737).

Meridiana LINN. f. Suppl. 248 (1781).

Merida NECK. Elem. 1195 (1790).

Lamia VAND. Roem. Script. 116 (1796).

Baillon, *Hist. Pl.* IX, 67; Benth. and Hook., *Gen. Pl.* I, 156; Durand, *Ind. Gen. Phan.* 31; Engler and Prantl, *Nat. Pflanz.* 3, I b, 59 (Pax); Gray, *Ill. Gen.* I, 227.

Living species: $20 \pm$; tropical and subtropical regions, especially N. America and N. Australia. One species cosmopolitan; one other widely diffused. 16 sp. (B. and H.); Russia, Russian Europe and Europe, 1; North America, 10; W. Tex., 6; Calif., 3; S. Sts., 3; Rocky mts., 1; E. Sts., 2; Pl. King, 1; Pl. Wheel., 1-2.

Portulaca retusa ENGELM. and GRAY, *Pl. Lindh.* 154 (1845).

Wats. and Coult., *Gray's Man.*, 6 ed. 90; Coult., *Fl. Colo.* 37; Brew. and Wats., *Fl. Calif.* I, 74; Upham, *Fl. Minn.* 33; Coult., *Fl. Tex.* 31; Wats., *Bibl. Ind.* I, 121.

North America: Colo. river to Tex.; N. to Ark.? Kan., Iowa and Minn.

Minn. valley: West and on higher levels; waste ground along streams.

XXXVIII. CARYOPHYLLACEAE. Pink Family.

Endlicher, *Gen. Pl.* 955 (1840); St. Hil., *Mem. Plac. Lib.* 56 (1816)—*Paronychieae*; R. Br., *Prodr.* 413 (1810)—*Illecebraceae*; De Candolle, *Fl. France*, 3 ed. IV, 766 (1805)—*Alsinaceae*; Bartling, *Ord. Nat.* 305 (1830)—*Silenaceae* and 300, *Scleranthaceae*; Benth. and Hook., *Gen. Pl.* I, 141; III, 12 (1865-1880); Pax, Engler and Prantl, *Nat. Pflanz.* 3, I b, 60 (1889).

Genera: 70; cosmopolitan in distribution.

Species: 1250; many cosmopolitan; principally in N. temperate zone.

SILENE LINN. Gen. 372 (1737).

Heliosperma REICH. Ic. Fl. Germ. VI, 277 (1842).

Elisanthe FENZL. Endl. Gen. 972 (1836-40).

Carpophora KLOTZSCH, Reis. Wald. 139 (1840?).

Cucubalus SPACH, Suit. Buff. V, 172 (1838).

Baillon, *Hist. Pl.* IX, 109; Benth. and Hook., *Gen. Pl.* I, 147; Durand, *Ind. Gen. Phan.* 29; Engler and Prantl, *Nat. Pflanz.* 3, I b, 70 (Pax).

Living species: 300+; 480+ described; 250 (Durand); 31+, N. America; 12-15, S. Africa; the rest in the Mediterranean region and extra-tropical Asia. Russia, 70; Europe, 150+; Russian Europe, 37; Calif., 22; Canada, 12-15; E. Sts., 8; S. Sts., 9; W. Tex., 2; Pl. King, 5; Pl. Wheel., 6; Rocky mts., 6.

Silene antirrhina LINN. Spec. 419 (1753).

Saponaria dioica CHAM. and SCHL. Linn. I, 38 (1826).

Wats. and Coult., Gray's Man. 6 ed. 84; Coult., Fl. Colo. 32; Webb., Fl. Neb. 114; Chap., Fl. S. St. 52; Upham, Fl. Minn. 32; Britt., Fl. N. J. 61; Brew. and Wats., Fl. Calif. I, 63; Mac., Fl. Can. I, 67; Engl. Pax, Nat Pflanz. III, 1, 72; Coult., Fl. Tex. 29; Greene, Fl. Fran. 116; Wats., King Exp. 36, 432; Cov., Fl. Ark. 168; Wats., Bibl. Ind. I, 106.

North America: Ottawa to Vancouver; S. to Calif., Colo., Tex., and E. to Maine and Fla.; Gt. Basin.

Minn. valley: Forest region and wooded banks; especially E. and S.; open places in woods.

HERB.: *Sheldon* 713, Sleepy Eye; *Taylor* 476, Janesville; *Ballard* 248, Jordan, Scott Co.; *Ballard* 589, Crystal lake, Scott Co.; *Kassube* 42, Mendota; *Holzinger* 37, Winona Co.; *Herrick* 50, Minneapolis; *Sandberg* 92, Cannon Falls.

Silene virginica LINN. Spec. 419 (1753) in part.

S. catesbaei WALT. Fl. Car. 141 (1788).

S. coccinea MOENCH, Suppl. 306 (1802).

Melandryum virginicum A. BR. Reg. Flora (1843).

Wats. and Coult., Gray's Man. 6 ed. 84; Britt., Fl. N. J. 61; Upham, Fl. Minn. 31; Chap., Fl. S. St. 51; Mac., Fl. Can. I, 67; Wats., King Exp. 431; Cov., Fl. Ark. 168; Wats., Bibl. Ind. 110.

North America: S. W. Ont., W. N. Y. to N. J.; S. to Tenn.; W. to Minn., Ark. and Nev.

Minn. valley: Nicollet Co.; local and rare.

Silene alba MUHL. Cat. (1813).

Cucubalus niveus NUTT. Gen. I, 287 (1818).

Silene nivea DC. Prodr. I, 377 (1824).

Wats. and Coult., Gray's Man. 6 ed. 84; Upham, Fl. Minn. 31; Wats., King Exp. 431; Wats., Bibl. Ind. I, 108.

North America: Penn. to Iowa and Minn.

Minn. valley: S. and E.; rare; localities like *S. stellata* (Linn.).

HERB.: *Holzinger* 36, Winona Co.; *Sandberg* 91, Cannon Falls.

Silene stellata (LINN.) AIT. f. Hort. Kew. III, 84 (1811).

Cucubalus stellatus LINN. Spec. 414 (1753).

Wats. and Coult., Gray's Man. 6 ed. 84; Upham, Fl. Minn. 31. Webb., Fl. Neb. 115; Britt., Fl. N. J. 60; Chap., Fl. S. St. 51; Mac., Fl. Can. I, 67; Wats., King Exp. 432; Cov., Fl. Ark. 168; Wats., Bibl. Ind. I, 109.

North America: Can. side of Niagara river to R. I., N. J. and Va.; W. to Minn., Neb., Colo., Ark. and Utah.

Minn. valley: Throughout; banks of streams and lakes and in woodland.

HERB.: *Ballard* 698, Waconia; *Ballard* 565, Prior's lake, Scott Co.; *Ballard* 792, Goose lake, Carver Co.; *Ballard* 734, Waconia; *Sheldon* 561, Waseca; *Sheldon* 990, Sleepy Eye; *Sheldon* 1259, Lake Benton; *Taylor* 616, Minnesota lake; *Sheldon* 1487, Pipestone city; *Holzinger* 34, Winona Co.; *Herrick* 49, Minneapolis; *Sandberg* 90, Goodhue Co.; *Holzinger* 35, Winona Co.; *Herb. Wickersheim*, 23, Lake Benton.

STELLULARIA LINN. Syst. ed. VI, (1748) ex. Kuntze, Rev. Gen. I, 52 (1891).

Stellaria BENTH. and HOOK. Gen. Pl. I, 140 (1862).

Krascheninikowia TURCZ. Flora B. b., 9 (1834).

Brachystemma DON. Prodr. Nep., 216 (1803).

Adenonema BUNGE, Suppl. Alt., 36 (1836).

Spergulastrum MICHX. Fl. Bor.-Amer., I, 295 (1803).

Micropetalon PERS. Syn. I, 500 (1805).

Larbraea ST. HIL. Mem. Mus. Par., II, 287 (1816).

Leucostemma BENTH. Royle, Him., 81 (1839).

Schizothecium FENZL. Endl. Gen., 969 (1836-40).

Baillon, *Hist. Pl.* IX, 113; Benth. and Hook, *Gen. Pl.* I, 149; Durand, *Ind. Gen. Phan.* 30; Engler and Prantl, *Nat. Pflanz.* 3, I b. 79 (Pax); Gray, *Ill. Gen.* II, 37; O. Kuntze, *Rev. Gen.* I, 52.

Living species: 80+; 70 (B. and H.); temperate and colder regions, also a few in high mountains in the tropics; Russia, 37; Europe, 16; Russian Europe, 15; North America, 20; Canada, 15; Rocky mts., 7; mid. Calif., 7; S. Sts., 5; E. Sts., 7; Pl. King, 6; Pl. Wheel., 3.

Stellularia crassifolia (EHRH.) ASCHERSON, Fl. Prov. Brand., 932 (1864).

Stellaria crassifolia EHRH. Beitr., III, 360 (1788).

S. borealis var. *B.* HOOK. Fl. Bor.-Am., I, 95 (1833).

Wats. and Coult., Gray's Man. 6 ed. 87; Coult., Fl. Colo. 34; Upham, Fl. Minn. 32; Trautv., Fl. Sib. 35; Regel, Fl. O.-Sib. I, 394; Mac., Fl. Can. I, 75, 497; Led., Fl. Ross. I, 383; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 28; Wats., King Exp. 417; Roth., Wheel. Exp. 71; Wats., Bibl. Ind. I, 111; Hart., Fl. Scand. I, 238; Rothr., Alask. 444.

N. Europe; N. Asia; Siberia—Baikal region; Kamtk.

North America: Gulf of St. Lawrence, Man. to Alaska; Labrador; N. Br. and Anticosti; S. to Minn., Ill., Ky. and W. to Mont. and Colo.

Minn. valley: N. E. district, Ft. Snelling and E. edge; ditches and marshes; rare.

HERB.: ? *Sandberg* 96, Cannon Falls.

***Stellularia longipes* (GOLDIE).**

Stellaria longipes GOLDIE, Edin. Phil. Journ. VI, 185 (1822).

S. glauca MEY. Pl. Labr. 93 (1830).

S. crassifolia WATS. King Exp. 35 (1875).

S. longifolia ROTH. Wheel. Exp. 35 (1818).

Wats. and Coult., Gray's Man. 6 ed. 87; Coult. Fl. Colo. 34; Upham, Fl. Minn. 32; Brew. and Wats., Fl. Calif. I, 68; Regel, Fl. O.-Sib. I, 415; Mac., Fl. Can. I, 75; Led., Fl. Ross. I, 386; Nym., Fl. Eur.; Herd., Fl. Russ. Eur. 28; Wats., Bibl. Ind. I, 112; Greene, Fl. Fran. 122; Hart., Fl. Scand. I, 237; Rothr., Alask. 444.

Altai Siberia, Kamtk., Dahuria, Spitzberg., N. Zembla, Iceland.

North America: Greenland and N. S. to Pac. and Arctic ocean; S. to Yosemite; E. to Maine, Minn. and Wisc.; Alaska, Labrador and Cape Chudleigh in var.

Minn. valley: N. E. and possibly in the whole forest district; rare; grassy places.

HERB.: *Ballard* 3, Chaska; *Sandberg* 95, Chisago Co.; *Kassube* 44, Minneapolis.

***Stellularia longifolia* (MUHL.) O. KUNTZE, Rev. Gen. Pl. I, 55 (1891).**

Stellaria longifolia MUHL. Willd. Enum. 479 (1809).

Spergulastrum gramineum MICHX. Fl. Am. I, 276 (1803).

Micropetalon gramineum PERS. Syn. I, 509 (1805).

Stellaria graminea BIGEL. Fl. Bost. ed. I, 110 (1814).

Micropetalon longifolium EAT. and WRIGHT, Man. 319 (1840).

Wats. and Coult., Gray's Man. 6 ed. 87; Britt., Fl. N. J. 63; Upham, Fl. Minn. 32; Coult. Fl. Colo. 34; Regel, Fl. O.-Sib. I, 406, 415; Mac., Fl. Can. I, 74; Led., Fl. Ross. I, 392; Miyabe, Fl. Kur. 221; Herd., Fl. Eur. Russ. 28; Wats., Bibl. Ind. I, 112; Webb., Appx. Neb. 27; Rothr., Alask. 444.

Siberia, Manchuria, Kamtschatka, Saghalin and Kurile Isls.; mid. Russia-in-Europe.

North America: N. S. to Pac. and Alaska; N. to lat. 54° and 64°; S. to Oregon; E. to Minn., N. J. and N. Eng.

Minn. valley: Forest district and banks of streams; meadows and grassy places in forest openings. E. and N.

HERB.: *Taylor* 306, Janesville; *Sheldon* 130, Madison Lake; *Sheldon* 555, Waseca; *Herrick* 52, Minneapolis; *Bailey* 102,

Vermilion lake; *Sandberg* 94, Tower; *Holzinger* 38, Goodhue Co.; *Holzinger* 39, Winona Co.; *Herb. Sheld.* 1720, Minneapolis; *Herb. Moger* 39, Chippewa river near Montevideo.

CERASTIUM LINN. Gen. 376 (1737).

Dichodon BARTL. Endl. Gen. 970 (1836-40).

Moenchia EHRH. Beitr. II, 177 (1788).

Pentaple REICH. Ic. Fl. Germ. V, 37 (1842).

Dufourea GREN. ex Endl. Gen. 967 (1836-40).

Esmareckia REICH. Ic. Fl. Germ. V, 227 (1842).

Benth. and Hook., *Gen. Pl.* I, 148; Baillon, *Hist. Pl.* IX, 112. Durand, *Ind. Gen. Phan.* 30; Engler and Prantl, *Nat. Pflanz.* 3, I b. 80-81 (Pax); Gray, *Ill. Gen.* II, 39.

Living species: 60±; 100 described; 40 (B. and H.); 45 (Durand); Russia, 35; Europe, 39; Russian Europe, 18; 9-11, North America; Canada, 9; mid. Calif., 4; S. Sts., 4; E. Sts., 2; Rocky mts., 3; Pl. King, 3; Pl. Wheel., 3; W. Tex., 2.

Cerastium arvense LINN. Spec. 438 (1753).

C. pennsylvanicum HORNEM. Hort. Hafn. 435 (1813).

C. elongatum and *tenuifolium* PURSH, Fl. Am. 321 (1814).

Wats. and Coult., Gray's *Man.* 6 ed. 88; Britt., Fl. N. J. 62; Upham, Fl. Minn. 33; Coult., Fl. Colo. 33; Brew. and Wats., Fl. Calif. I, 67; Hook., Fl. Gt. Brit. 60; Chap., Fl. S. St. 50; Regel, Fl. O.-Sib. I, 444 Mac., Fl. Can. I, 77; Forbes and Hems., Fl. Sin. 66; Led., Fl. Ross. I, 412; Nym., Fl. Eur.; Herd., Eur. Russ. 28; Wats., Bibl. Ind. I, 100; Engl. Pax, Nat. Pflanz. III, 1, 80; Roth., Wheel. Exp. 71; Wats., King Exp. 38; Greene, Fl. Fran. 121.

Arctic Europe; N. Africa; Siberia; W. Asia; Patagonia; Chile.

North America: N. S. to Vancouver; N. U. S. from Maine to Va.; W. to Minn., Colo., Utah, Nev. and Calif.

Minn. valley: Throughout; but rare; less common E. than W.; dry or rocky places.

HERB.: ? *Sandberg* 98, Cannon Falls; *Herb. Wickersheim* 24, Idlewild, Lincoln Co.; *Sheldon* 1490, Pipestone city.

Cerastium arvense LINN. var. bracteatum (RAF.).

C. arvense PURSH. Fl. Am. 231 (1814).

C. villosum MUHL. Cat. 46 (1813).

C. bracteatum RAF. Prec. Decouv. 36 (1817).

C. pubescens GOLDIE, Edin. Phil. Journ. IV, 328 (1821).

C. oblongifolium TORR. Fl. U. S. 460 (1824).

C. pennsylvanicum HOOK. Fl. Bor.-Am. I, 104 (1833).

C. arvense var. *oblongifolium* BRITT. and HOLL.

Wats. and Coult., Gray's *Man.* 6 ed. 88; Upham, Fl. Minn. 32; Regel, Fl. O.-Sib. I, 445; Mac., Fl. Can. I, 77; Forbes and Hems., Fl. Sin. 66; Herd., Fl. Eur. Russ. 28; Engl. Pax, Nat. Pflanz. III, 1, 80; Wats., Bibl. Ind. I, 101.

Species in N. Eur. and N. Asia to Himalayas and China; variety perhaps in Amurland and Baikal Siberia.

North America: Ont. and N. Y. to N. J., Minn. and Mo.

Minn. valley: S. E. districts; rare; rocky or sandy banks.

HERB.: *Holzinger 39*, Winona Co.

Cerastium nutans RAF. Prec. Decouv. 36 (1814).

C. longipedunculatum MUHL. Cat. 47 (1813).

C. glutinosum NUTT. Gen. I, 291 (1818).

C. tenellum FENZL. Ann. Mus. Wien (1835).

C. oblongifolium ANDERS. Cat. Pl. Nev. 118 (—).

Wats. and Coult., Gray's Man. 6 ed. 88; Coult., Fl. Colo. 33; Webb., Fl. Neb. 114; Chap., Fl. S. St. 50; Brew. and Wats. Fl. Calif. I, 66; Britt., Fl. N. J. 63; Upham, Fl. Minn. 32; Mac., Fl. Can. I, 77; Roth., Wheel. Exp. 71; Wats., King Exp. 38; Cov., Fl. Ark. 168; Wats., Bibl. Ind. I, 100; Hart. Fl. Scand. I, 239.

North America: N. S., N. Br., Q. to Man., Hudson Bay and Vancouver; S. to Vt., N. J., Penn. and N. Car., Tenn. and Ark.; W. to Colo., Minn., Neb., Utah, Washington; S. in Rockies to Northern Mexico.

Minn. valley: Forest district to Blue Earth Co.; banks of streams to Chippewa river; moist woods and meadows.

HERB.: *Sheldon 182*, Eagle lake, Blue Earth Co.; *Taylor 68*, Elysian; *Sandberg 97*, Vasa; *Kassube 45*, Minneapolis; *Holzinger 38*, Winona Co.; *Leiberg 12*, Blue Earth Co.; *Herb. Moyer 40*, Montevideo; *Herb. Sheld. 1871*, Ramsey Co.

MOEHRINGIA LINN. Gen. ed. II, 386 (1742).

Engler and Prantl, *Nat. Pflanz.* 3, I b, 84 (Pax); Baillon, *Hist. Pl.* IX, 113; Benth. and Hook., *Gen. Pl.* I, 150; Durand, *Ind. Gen. Phan.* 30; Gray, *Ill. Gen.* II, 35.

Living species: 20±; colder regions of N. hemisphere.

Moehringia lateriflora (LINN.) FENZL. Ann. Mus. Wien, I, 18, 38 (1835).

Arenaria lateriflora LINN. Spec. 423 (1753).

A. buxifolia POIR. Enc. Meth. VI, 362 (1804).

Stellaria biflora PURSH, Fl. Am. 317 (1814)

Arenaria pennsylvanica MUHL. Ind. Fl. Lancaster, 169 (1817).

Wats. and Coult., Gray's Man. 6 ed. 86; Britt., Fl. N. J. 64; Webb., Fl. Neb. 114; Coult., Fl. Colo. 36; Upham, Fl. Minn. 32; Brew. and Wats., Fl. Calif. I, 70; Regel, Fl. Ost.-Sib. I, 376; Trautv., Fl. Sib. 35; Mac. Fl. Can. I, 73, 497; Miyabe, Fl. Kur. 221; Engl. Pax, *Nat. Pflanz.* 3, I, 84; Roth., Wheel. Exp. 72; Wats., Bibl. Ind. I, 96; Hart., Fl. Scand. I, 242; Rothr., Alask. 444.

Kamtschatka; Dahuria; Baikal Sib.; Kurile Isls. to Scandinavia.

North America: N. S. to Vancouver, lat. 60° N. and Ft. Selkirk, Alaska; S. to Oregon; S. to N. Eng., N. J., Penn.; W. to Minn., Neb. and Mo.

Minn. valley: E. and N. E. districts; shores of lakes and streams.

HERB.: *Ballard* 392, Jordan, Scott Co.; *Sheldon* 512, Waseca; *Ballard* 51, Chaska; *Taylor* 280, Janesville; *Herrick* 51, Minneapolis; *Kassube* 43, Minneapolis; *Sandberg* 93, Red Wing; *Herb. Sheld.* 1890, Minneapolis; 1759, St. Paul.

ANYCHIA RICH. Michx. Fl. Bor.-Am. I, 112 (1803) p. p.

Baillon, *Hist. Pl.* IX, 122; Benth. and Hook., *Gen. Pl.* III, 16; Engler and Prantl, *Nat. Pflanz.* 3, I b, 91 (Pax); Durand, *Ind. Gen. Phan.* 332 Gray, *Ill. Gen.* 19.

Living species: 2; E. North America from Canada to Texas.

Anychia dichotoma (MOENCH) MICHX. Fl. N. Am. I, 113 (1803).

Queria dichotoma MOENCH, Meth. 351 (1794).

Q. canadensis NUTT. Gen. I, 158 (1818).

Paronychia dichotoma FENZL. Walp. Rep. I, 262 (1842).

Paronychia canadensis WOOD, Bot. 262 (1861).

Wats. and Coult., Gray's Man. 6 ed. 426; Britt., Fl. N. J. 204; Upham, Fl. Minn. 33; Chap., Fl. S. St. 46; Mac., Fl. Can. I, 81; Wats., Bibl. Ind. I, 114.

North America: Ont.? and N. Eng. to Fla.; W. to Minn. and Ark.?

Minn. valley: Doubtfully present.

XXXIX. NYMPHAEACEAE. Water-Lily Family.

Benth. and Hook., *Gen. Pl.* I, 45 (1862); Baillon, *Hist. Pl.* III, 77 (1872) excl. *Sarracena*; Caspary in Engler and Prantl, *Nat. Pflanz.* 3, II, 1 (1888).

Genera: 7 living; 3 fossil; cosmopolitan; in fresh water and sometimes in mud.

Species: 50 living; 10-15 fossil; particularly in sub-tropical S. America.

NELUMBO ADANS. Fam. Pl. II, 76 (1763).

Nelumbium JUSS. Gen. Pl. 68 (1789).

Cyamus SM. Exot. Bot. I, 59 (1804).

Baillon, *Hist. Pl.* III, 101; Benth. and Hook., *Gen. Pl.* I, 47; Engler and Prantl, *Nat. Pflanz.* (Caspary) 3, II, 5; Durand, *Ind. Gen. Phan.* 10 Gray, *Ill. Gen.* 97; Schenck, *Palaeophyt.* 509.

Living species: 2; North America: to W. Indies and U. S. of Colombia, 1; Japan, warmer regions of Australia and Asia to Caspian sea, 1.

Fossil species: 5-6; Upper Cretaceous, Greenland (*Heer*); S. Europe (*Ettinghausen*) Oligocene and Neocene.

Nelumbo nelumbo (LINN.) MACM. Torr. Bull. XIX (1891).

Nymphaea nelumbo var. *B.* LINN. Spec. 511 (1753).

Nelumbium luteum WILLD. Spec. II, 1259 (1799).

Nelumbo lutea PERS. Syst. (1805).

Cyamus pentapetalus PURSH, Fl. Am. 393 (1814).

Cyamus lutea NUTT. Gen. II, 25 (1818).

Nelumbium codophyllum RAF. Fl. Lud. 22 (1817).

Nelumbium jamaicense DC. Syst. II, 47 (1821).

Wats. and Coult., Gray's Man. 6 ed. 55; Britt., Fl. N. J. 43; Webb., Fl. Neb. 117; Chap., Fl. S. St. 18; Upham, Fl. Minn. 22; Mac., Fl. Can. I, 31, 484; Gris., Fl. W. I.; Engl. Caspary, Nat. Pflanz. III, 2, 5; Coult. Fl. Tex. 11; Cov., Fl. Ark. 164; Wats., Bibl. Ind. I, 36.

U. S. of Colombia; Jamaica.

North America: Ont. to N. Eng. and N. J.; Fla.; W. to Mich., Minn., Neb. and Tex. on the Rio Grande.

Minn. valley: Reported at Mendota and Halstead's bay, Lake Minnetonka; local, N. E.

HERB.: *Holzinger* 12, Fountain City; *Sandberg* 44, Red Wing.

BRASENIA SCHREB. Gen. Pl. 372 (1774).

Ixodia SOLAND. Mss. ex Endl. Gen.

Hydropeltis L. C. RICH. Ann. Mus. XVII, 230 (1811).

Baillon, *Hist. Pl.* III, 102; Benth. and Hook., *Gen. Pl.* I, 46; Engler and Prantl, *Nat. Pflanz.* (Caspary) 3, II, 6; Durand, *Ind. Gen. Phan.* 10; Gray, *Ill. Gen.* 95; Schenck, *Palaeophyt* 509 (sub *Nymphaeites*?).

Living species: 1. In all regions outside of Europe and arctic or subarctic zones. Asia, Africa, Oceanica. America.

Fossil species: A number of leaves are referred to the Nymphaeaceae by different authors; some of which doubtless bear affinities with *Brasenia*. See *Caspary*, Monog. Nymph. and *Saporta*, Untersuchungen. Dawson (Can. Geol. Surv.) reports *Brasenia* from the Eocene of Canada. It doubtless dates back to the Cretaceous or Jurassic.

Brasenia peltata (THUNB.) PURSH, Fl. Am. 389 (1814).

Menyanthes peltata et *nymphoides* THUNB. Nov. Act. Ups. VII, 142 (1746).

Hydropeltis purpurea MICHX. Fl. N. Am. I, 324 (1803).

Brasenia hydropeltis MUHL. Cat. 55 (1813).

Limnanthemum peltatum GRISEB. Gent. 348 (1839).

Brasenia purpurea CASP. Ann. Mus. Lugd.-Bat. II, 256 (1850).

Brasenia nymphoides BAILL. Hist. Pl. III, 82 (1872).

Wats. and Coult., Gray's Man. 6 ed. 55; Britt., Fl. N. J. 43; Upham, Fl. Minn. 21; Chap., Fl. S. St. 19; Brew. and Wats., Fl. Calif. I, 16; Mac., Fl. Can. I, 483; Cov., Fl. Ark. 164; Wats., Bibl. Ind. I, 36; Engl. Caspary, Nat. Pflanz. III, 2, 6.

E. India; Japan; one station in tropical W. Africa; Australia; Cuba.

North America: Local from N. S., N. Br., Q., Ont., Man. to Puget Sound. S. to Tex. and Fla. Absent in lower Miss. valley and Rocky mt. region?; S. in Calif.?

Minn. valley: N. localities; principally N. E. in valley; local in lakes and ponds, sometimes abundant.

HERB.: *Sheldon* 704, White Bear; *Sheldon* 492, Jefferson lake, Le Sueur Co.; *Ballard* 898, Waconia lake, Carver Co.; *Ballard* 854, Page lake, Carver Co.; *Herrick* 22, Minneapolis.

LEUCONYMPHAEA LUDW. Def. Pl. 69 (1737).

Castalia SALISB. Parad. Lond. 14, 68 (1805).

Nymphaea LINN. Gen. 653 (1737) *Emend.* SM. Prodr. Gr. I, 361 (1808).

Baillon, *Hist. Pl.* III, 102; Benth. and Hook., *Gen. Pl.* I, 46; Engler and Prantl, *Nat. Pflanz.* 3, II, 7 (Caspary); Durand, *Ind. Gen. Phan.* 10; Gray, *Ill. Gen.* I, 101; Schenck, *Palaeophyt.* 509; O. Kuntze, *Rev. Gen.* I, 12.

Living species: 32; 20 (B. and H.); 25 (Durand); temperate regions of Northern hemisphere; Africa, Australia, South America, and a few in tropical waters. 1 sp. almost cosmopolitan; Russia, 5; Europe, 3; Russian Europe, 3; North America, 6; Canada, 3; E. Sts., 2; S. Sts., 2; Tex., 3; Rocky mts., 1.

Fossil species: Upper Cretaceous, South of France, Tertiary N. Amer., France and Germany (*Heer*, *Lesquerx.*, *Saporta*, *Ettinghausen*) 6–10 sp.

Leuconymphaea reniformis (DC.).

Nymphaea reniformis DC. Syst. II, 55 (1821).

N. alba NUTT. Gen. II, 13 (1818).

N. maculata and *spiralis* RAF. Med. Bot. II, 45 (1830).

N. tuberosa PAINE, Cat. Pl. Oneida 184 (1864).

Castalia tuberosa GREENE, Torr. Bull. XV, (1888).

C. reniformis COV. Fl. Ark. 164 (1891).

Britt., Fl. N. J. 44; Webb., Fl. Neb. 117; Upham, Fl. Minn. 22; Mac., Fl. Can. I, 31; Engl. Caspary, Nat. Pflanz. III, 2, 9; Wats., Bibl. Ind. I, 39; Wats. and Coult., Gray's Man. 6 ed. 56.

North America: Region around the Great Lakes. Common throughout Minn., Wisc., Mich., Ont. and Man.?

Minn. valley: Abundant throughout in lakes and ponds, especially in the forest region.

HERB.: *Ballard* 456, Prior's lake, Scott Co.; *Sheldon*

369, Duck lake, Blue Earth Co.; *Ballard* 412, Jodan, Scott Co.; *Bailey* 138, Vermilion lake.

***Leuconymphaea odorata* (DRYAND.).**

Nymphaea alba WALT. Fl. Car. 155 (1788).

N. odorata DRYAND. B. B. (1789).

N. odorata AIT. Hort. Kew. II, 227 (1789).

Castalia pudica SALISB. Parad. Lond. 14 (1806).

C. odorata WOODY. and WOOD, Rees Cycl. VI, 1 (1819).

C. odorata GREENE, Torr. Bull. XV (1888).

Wats. and Coult., Gray's Man. 6 ed. 55; Britt., Fl. N. J. 619; Mac., Fl. Can. I, 31; Chap., Fl. S. St. 19; Upham, Fl. Minn. 22; Engl. Caspary, Nat. Pflanz. III, 2, 9; Cov., Fl. Ark. 164; Wats., Bibl. Ind. I, 38.

North America: N. S., N. Br., Q., Ont. to Man.; S. to N. Eng., N. J. and Fla.; W. to Ohio, Minn. and Ark.

Minn. valley: Reported from Lake Crystal, Blue Earth Co., and probably sparingly in E. and S. parts of forest region. Lakes and ponds.

HERB.: ? *Kassube* 19, Minneapolis; *Sandberg* 45, Chisago Co.

NYMPHAEA LUDW. Defin. Pl. (1737).

***Nymphosanthus* RICH. Anal. Fr. 68 (1808—May).**

***Nuphar* SM. Prodr. Fl. Graec. I, 361 (1808—09).**

***Nenuphar* HAYNE, MSS. ex Endl. Gen. (1840).**

Baillon, *Hist. Pl.* III, 102; Benth. and Hook., *Gen. Pl.* I, 46; Engler and Prantl, *Nat. Pflanz.* 3, II, 9 (Caspary); Durand, *Ind. Gen. Phan.* 10; O. Kuntze, *Rev. Gen. Pl.* I, 12; Gray, *Ill. Gen.* I, 103; Schenck, *Palaeophyt.* 509.

Living species: 7; 3—4 (B. and H.); Northern hemisphere, in arctic, temperate and warmer regions, extra-tropical. Russia, 3; Europe, 3; North America, 5; Canada, 4; Calif., 2; E. Sts., 3; Rocky mts., 1; S. Sts., 2; Pl. King, 1.

Fossil species: Probably several remains are to be placed here. Tertiary and Interglacial; France, England, N. America. See *Caspary*, *Monog.*, *Ann. Sci. Nat.* ser. 4, VI, 216.

***Nymphaea advena* SOLANDER, v. Bibl. Banks.**

N. lutea WALT. Fl. Car. 154 (1788).

N. arifolia SALISB. Ann. Bot. II, 71 (1806).

Nuphar advena AIT. f. Hort. Kew. III, 295 (1811).

Wats. and Coult., Gray's Man. 6 ed. 56; Webb., Fl. Neb. 117; Britt., Fl. N. J. 44; Coult., Fl. Colo. 12; Chap., Fl. S. St. 20; Upham, Fl. Minn. 22; Mac., Fl. Can. I, 32; ?Led., Fl. Ross. I, 84; Mac., Fl. Can. I, 484; Engl. Caspary, *Nat. Pflanz.* III, 2, 9; Coult., Fl. Tex. 11; Wats., *King Exp.* 13; Cov., Fl. Ark. 164; Wats., *Bibl. Ind.* I, 37.

Eastern Siberia?

North America: Anticosti, Labrador, N. S., N. Br.,

Q., Ont. to Brit. Col.; N. to lat. 57°; U. S., except Pac. coast reg. and far S. W.—Yellowstone Park to W. Tex.

Minn. valley: Throughout in ponds, lakes and sluggish streams; often semi-terrestrial in flats and sloughs.

HERB.: *Ballard* 457, Prior's lake, Scott Co.; *Sheldon* 320, Madison Lake; *Taylor* 81, Elysian; *Taylor* 315, Janesville; *Kassube* 20, Minneapolis; *Sandberg* 46, Vasa.

XL. CERATOPHYLLACEAE. Hornwort Family.

Benth. and Hook., *Gen. Pl.* III, 415 (1880); Endlicher, *Gen. Pl.* 267 (1840); Baillon, *Hist. Pl.* III, 479 (1872); Engler in *Engler and Prantl, Nat. Pflanz.* 3, II, 10 (1888).

Genera: 1; cosmopolitan; except in arctic and ant-arctic regions.

Species: 3; in standing water, lakes and ponds.

CERATOPHYLLUM LINN. Gen. 725 (1737).

Hydroceratophyllum VAILL. Act. Par. (1719).

Dichotophyllum DILL. Gen. 91 (1719).

Baillon, *Hist. Pl.* III, 495; Benth. and Hook., *Gen. Pl.* III, 382; Durand, *Ind. Gen. Phan.* 382; Schenck, *Palaeophyt.* 632.

Living species: 10 described; 3 reduced; perhaps only 1; cosmopolitan.

Fossil species: *C. vulgaris* in Forest Bed of Cromer (Schenck)?

Ceratophyllum demersum LINN. Spec. 992 (1753).

Wats. and Coult., *Gray's Man* 6 ed. 488; Britt., *Fl. N. J.* 228; Chap., *Fl. S. St.* 398; Mac., *Fl. Can.* I, 459; Coult., *Fl. Colo.* 328; Wats., *Fl. Calif.* II, 78; Upham, *Fl. Minn.* 122; Led., *Fl. Ross.* II, 123; Nym., *Fl. Eur.*; Hook., *Fl. Gt. Brit.* 378; Herd., *Fl. Eur. Ross.* 52; Wats., *King Exp.* 319; Cov., *Fl. Ark.* 221; Hart., *Fl. Scand.* I, 384; Webb., *Appx. Neb.* 27; Greene, *Fl. Fran.* 230.

Europe and mid. Russ. to Caucasus; all Siberia to Japan.

North America: Ont., Sault Ste. Marie and L. Winnipegosis to Washington, S. Calif. and Nev.; E. across cont. to N. Eng., N. J. and Fla.

Minn. valley: Reported from N. E. district; lakes and ponds. Aquatic.

XLI. RANUNCULACEAE. Crowfoot Family.

Endlicher, *Gen. Pl.* 843; Benth. and Hook., *Gen. Pl.* I, 1 (1862); Prantl, *Engler and Prantl, Nat. Pflanz.* 3, IV, 43 (1888).

Genera: 25; cosmopolitan; principally N. hemisphere.

Species: 1,000±; many cosmopolitan.

HYDRASTIS LINN. Gen. ed. VI, 704 (1764).

Baillon, *Hist. Pl.* I, 87; Benth. and Hook. *Gen. Pl.* I, 7; Engler and Prantl, *Nat. Pflanz.* 3, II, 55; Durand, *Ind. Gen. Phan.* 2; Gray, *Ill. Gen.* 47.

Living species: 2; Northern Japan, 1; subarctic and Atlantic forest region of N. Amer., 1.

Hydrastis canadensis LINN. Spec. 2 ed. 784 (1763).

Wats. and Coult., Gray's Man. 6 ed. 48; Britt., Fl. N. J. 40; Chap., Fl. S. St. 11; Upham, Fl. Minn. 20; Mac., Fl. Can. I, 27, 483; Engl. Prantl, *Nat. Pflanz.* III, 2, 55; Cov., Fl. Ark. 163; Wats., Bibl. Ind. I, 14.

North America: W. Ont. and Niagara river to N. Y., N. J. and Ga.; W. to Ohio, Tenn., Minn., Mo. and Ark.

Minn. valley: Reported from N. edge, and probably occurring rarely in N. forest region.

CALTHA LINN. Gen. 463 (1737).

Thacla SPACH, Suit. Buff. VII, 295 (1839).

Psychrophila Gay, Fl. Chile I, 47 (1845).

Populago TOURN. Inst. 273 (1700).

Baillon, *Hist. Pl.* I, 23 (sub *Trollius*); Benth. and Hook., *Gen. Pl.* I, 6; Engler and Prantl, *Nat. Pflanz.* 3, II, 56; Durand, *Ind. Gen. Phan.* 2; Gray, *Ill. Gen.* I, 31.

Living species: 16±; 9 (B. and H.); 10 species in northern, extratropical regions; 6-8 sp. Andes and Antarctic America, Australia and New Zealand. Russia, 4; N. America, 4-9; Canada, 4-6; E. Sts. 1; Calif., 2; S. Sts., 1; Pl. King, 1; Pl. Wheel., 1; Russian Europe, 2; Rocky mts., 1-2.

Caltha palustris LINN. Spec. 784 (1753).

C. arctica R. BR. Parr. 1st Voy. Appx. 265 (1824).

Wats. and Coult., Gray's Man. 6 ed. 44; Britt., Fl. N. J. 38; Upham, Fl. Minn. 20; Hook., Fl. Gt. Brit. 11; Trautv., Fl. Sib. 12; Regel, Fl. O.-Sib. I, 52; Mac., Fl. Can. I, 23; Forbes and Hems., Fl. Sin. I, 17; Led., Fl. Ross. I, 48; Nym., Fl. Eur.; Herd., Fl. Russ. Eur. 10; Engl. Prantl, *Nat. Pflanz.* III, 2, 56; Cov., Fl. Ark. 163; Wats., Bibl. Ind. I, 8; Hart., Fl. Scand. I, 174; Rothr., Alask. 442.

Europe; N. and W. Asia and Siberia to Himalayas and China.

North America: Canada throughout and N. U. S. to Md., Ohio, Iowa, Dak. and Mont.

Minn. valley: Throughout at lower levels; swamps, sloughs, wet meadows, openings and with tamaracks.

HERB.: *Sheldon* 780, Sleepy Eye; *Sandberg* 36, Cannon Falls; *Leonard* 3, Minneapolis; *Herrick* 17, Minneapolis,

Holzinger 9, Winona Co.; *Hammond 2*, Lake City; *Herb. Sheld. 1828*, Ramsey Co.; *Herb. Moyer 19*, Montevideo.

ISOPYRUM LINN. Gen. ed. II, 533 (1742).

Coptis SALISB. Linn. Trans. VIII, 305 (1807).

Chrysa RAF. Desf. Journ. Bot. II, 170 (1806).

Enemion RAF. Jour. Phys. XCI, 70 (1820).

Leptopyrum REICHB. Fl. Germ. 747 (1833).

Chrysocoptis NUTT. Trans. Acad. Phil. VII, 9 (1843).

Pterophyllum NUTT. l. c. (1843).

Baillon, *Hist. Pl.* I, 85; Benth. and Hook., *Gen. Pl.* I, 8; Engler and Prantl, *Nat. Pflanz.* 3, II, 58; Durand, *Ind. Phan.* 2; O. Kuntze, *Rev. Gen. Pl.* 3; Gray, *Ill. Gen.* 35, 37.

Living species: 25; arctic and N. temperate regions; E. Asia, Japan and Himalayas; Atl. and Pac. North America; Russia, 6; Europe, 2; Japan, 8; North America, 7; Calif. and Oregon, 4; Can., 5; E. Sts., 2; S. Sts., 3.

Isopyrum trifolium (LINN.) BRITT. Torr. Bull. XVIII, 265 (1891).

Helleborus trifolius LINN. Amoen. II, 355 (1750).

Coptis trifolia SALISB. Trans. Linn. Soc. VIII, 305 (1798).

Chrysa borealis RAF. N. Y. Med. Rep. V, 350 (1808).

Wats. and Coult., Gray's Man. 6 ed. 45; Britt., Fl. N. J. 39; Upham, Fl. Minn. 20; Regel, Fl. O.-Sib. I, 61; Mac., Fl. Can. I, 23; Led., Fl. Ross, I, 52; Nym., Fl. Eur.; Miyabe, Fl. Kur. 216; Engl. Prantl, Nat. Pflanz. III, 2, 58; Wats., Bibl. Ind. I, 12; Rothr., Alask. 442.

Iceland; Kamtk. to Mid. Russ., Baikal Sib. and Mid. Japan.

North America: Greenland, Labrador, N. S., Newf., N. Br. to Rocky mts; S. to N. Eng., N. J., Md.; W. to Ohio, Iowa, Minn. and Dak.; Alaska.

Minn. valley: Forest region and perhaps in some prairie bogs; principally in tamarack swamps.

HERB.: *Leiberg 5*, Blue Earth Co.; *Sandberg 35*, Tower; *Roberts 6*, Devil's Neck river; *Leonard 2*, Minneapolis; *Bailey 312*, St. Louis river; *Herb. Sheldon 1825*, Lake Calhoun.

Isopyrum biternatum (RAF.) T. and G. Fl. I, 660 (1838).

Enemion biternatum RAF. Jour. Phys. II, 70 (1811?).

Isopyrum thalictroides SHORT, Pl. Kent. I, 8 (1833).

Wats. and Coult., Gray's Man. 6 ed. 44; Upham, Fl. Minn. 20; Chap., Fl. S. St. 9; Regel, Fl. O.-Sib. I, 62; Mac., Bot. Gaz. XVI, 285; Cov., Fl. Ark. 163; Wats., Bibl. Ind. I, 14.

Kamtschkatka.

North America: Ont. and Minn. to Ohio and Fla.; W. to Iowa.

Minn. valley: Forest region; Ft. Snelling to New

Ulm and N. in valley; damp woods and banks.

HERB.: *Sheldon* 178, Eagle Lake, Blue Earth Co.; *Winchell* 1, Minneapolis; *Sandberg* 34, Red Wing; *Herb. Sheld.* 1831, Minneapolis.

ACTAEA LINN. Gen. 427 (1737).

Cimicifuga LINN. Am. Acad. VIII, 193 (1755).

Botrophis RAF. Med. Rep. II, hex. V, 350 (1808).

Macrotys RAF. l. c. (1808).

Pityrosperma SIEB. and ZUCC. Act. Monac. III, 734 (1843).

Actinospora TURCZ. Mss., F. and M. Ann. Sci. Nat. Ser. 2, IV, 333 (1835).

Christophoriana TOURN. Inst. 299 (1700).

Baillon, *Hist. Pl.* I, 88; Benth. and Hook., *Gen. Pl.* I, 9; Engler and Prantl, *Nat. Pflanz.* 3, II, 59; Durand, *Ind. Gen. Phan.* 2; Gray, *Ill. Gen.* 49, 51.

Living species; 50 described; 10 (B. and H.); 12 Durand); Russia, 7+; Europe, 2; Asia, 10; North America, 8; Canada, 4-5; Calif., 4; S. Sts., 4; Rocky mts., 2.

Actaea alba (LINN.) MILL. Dict. (1768).

A. spicata var. *alba* LINN. Spec. 504 (1753).

A. americana var. *A* PURSH, Fl. Am. I, 366 (1814).

A. brachypetala var. *A* DC. Syst. I, 385 (1818).

A. pachypoda ELL. Sk. II, 15 (1824).

Wats. and Coult., Gray's Man. 6 ed. 48; Britt., Fl. N. J. 40; Upham, Fl. Minn. 21; Chap., Fl. S. St. 11; Mac., Fl. Can. 27; Wats., Bibl. Ind. I, 2; Greene, Pittonia, II, 107.

North America: Anticosti, N. S. N. Br., Q., Ont., Man. to Coast range in Brit. Col.; S. to N. Eng., N. J. and S. Car.; W. to Ark., Mo., Minn. and Dak.

Minn. valley: Forest region with *A. rubra* (Ait.). Perhaps rather less abundant.

HERB.: *Taylor* 701, Minnesota lake; *Sheldon* 804, Sigel township, Brown Co.; *Ballard* 405, Jordan, Scott Co.; *Herrick* 21, Minneapolis; *Sandberg* 39, Red Wing; *Bailey* 119, Vermilion lake; *Sandberg* 40, Chisago lake.

Actaea rubra (AIT.) WILLD. Enum. 561 (1809).

A. spicata var. *rubra* AIT. Hort. Kew. II, 221 (1789).

A. americana var. *B* PURSH, Fl. Am. 366 (1814).

A. brachypetala var. *B* DC. Syst. I, 385 (1818).

Wats. and Coult., Gray's Man. 6 ed. 48; Coult., Fl. Colo. 11; Webb., Fl. Neb. 115; Upham, Fl. Minn. 21; Britt., Fl. N. J. 40; Regel, Fl. O.-Sib. I, 119; Mac., Fl. Can. I, 27; Forbes and Hems., Fl. Sin. I, 21, species *spicata*; Engl. Prantl, Nat. Pflanz. III, 2, 59?; Led., Fl. Ross. I, 71; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 10; Wats., Bibl. Ind. I, 2; Hart., Scand. Fl. (*A. spicata*), I, 176.

? Temperate and Arctic Europe; Russ. to Caucasus and

Baikal Sib. and Mongolia; China; Dahuria. It is not clear that these references belong to the N. American plant which is quite probably distinct and endemic.

North America: N. S., N. Br. to Rocky mts. and lat. 60° N.; U. S.; from Atl. to mts. of Colo. and S. to Ohio, Iowa and N. J.

Minn. valley: Forest region throughout and wooded banks W. at lower levels; damp and dark groves.

HERB.: *Taylor* 516, Mud lake, Waseca Co.; *Sheldon* 860, Sleepy Eye; *Sheldon* 139, Madison Lake; *Sheldon* 82, Elysian; *Ballard* 56, Chaska; *Taylor* 263, Janesville; *Sandberg* 38, Cannon Falls; *Ocsthund* 9, Minneapolis; *Herrick* 19, Minneapolis; *Bailey* 291, St. Louis river; *Kassube* 17, Minneapolis; *Herrick* 20, Minneapolis; *Herb. Sheld.* 1823, Hennepin Co.; *Herb. Moyer* 22, Montevideo.

AQUILEGIA LINN. Gen. 450 (1737).

Baillon, *Hist. Pl.* I, 84; Benth. and Hook., *Gen. Pl.* I, 8; Engler and Prantl, *Nat. Pflanz.* 3, II, 59; Durand, *Ind. Gen. Phan.* 2; Gray, *Ill. Gen.* I, 39.

Living species: 50+ described; possibly only 6-8 actually distinct. Temperate northern hemisphere. Russia, 9; European Russia, 1; Europe, 8; North America, 8; Calif., 2; E. Sts., 2; Canada, 5; S. Sts., 1; Rocky mts., 7; Pl. Wheel., 4; Pl. King, 5

Aquilegia canadensis LINN. Spec. 533 (1753).

A. variegata MOENCH, Meth. 311 (1794).

A. elegans SALISB. Prodr. 374 (1796).

Wats. and Coult., Gray's Man. 6 ed. 46; Coult., Fl. Colo. 10; Webb., Fl. Neb. 116; Upham, Fl. Minn. 20; Chap., Fl. S. St. 9; Britt., Fl. N. J. 39; Mac., Fl. Can. I, 24; Led., Fl. Ross. I, 57; Engl. Prantl, Nat. Pflanz. III, 2, 59; Cov., Fl. Ark. 163; Wats., Bibl. Ind. I, 6.

Russian empire?

North America: Q., Ont., Man., Saskatchewan to Rocky mts.; S. E. to N. Eng., N. J., Fla. and W. in Northern States to Minn., Dak., Neb. and Colo.; S. in mts. to Arizona, N. Mex. and Mexico.

Minn. valley: Throughout, but principally in forest region; dry, wooded or sunny banks.

HERB.: *Sheldon* 139, Madison Lake; *Taylor* 799, Glenwood; *Ballard* 71, Chaska; *Taylor* 71, Elysian; *Sheldon* 934, Redwood Falls; *Taylor* 143, Janesville; *Kassube* 15, Minneapolis; *Sandberg* 37, Red Wing; *Leonard* 41, Washington P. O.; *Hammond* 4, Lake City; *Herb. Sheld.* 1818, Minneapolis; *Herb. Moyer* 20, Carlton lake, Chippewa Co.

DELPHINIUM LINN. Gen. 449 (1737).**Delphiniastrum** SPACH, Suit. Bufl. VII, 336 (1839).**Phledineum** SPACH, l. c. 337 (1839).**Staphysagria** SPACH, l. c. 347 (1839).**Aconitella** SPACH, l. c. 358 (1839).**Consolida** LINDL. Jour. Hort. Soc. VI, 55 (1851).**Ceratosanthus** SCHUR. Enum. Transsylv. 30 (1866).**Aconitum** LINN. Gen. 682 (1737).**Nirbisia** DON. Gen. Syst. I, 63 (1831).

Baillon, *Hist. Pl.* I, 85; Benth. and Hook., *Gen. Pl.* I, 9; Engler and Prantl, *Nat. Pflanz.* 3, II, 59, 60; Durand, *Ind. Gen. Phan.* 2; Gray, *Ill. Gen.* I, 41, 43.

Living species: 180±; 58 (B. and H.); 90 (Durand); temperate and mountainous regions of the northern hemisphere; Russia, 40±; Europe 28±; Russian Europe, 16; North America, 22+; and *Delphinium* (excl. *Aconitum*) 5, Canada; Calif., 9; E. Sts., 3; Rocky mts., 5; S. Sts., 3; Pl. Wheel., 4; Pl. King, 4.

Delphinium carolinianum WALT. Fl. Car. 155 (1788).*D. azureum* MICHX. Fl. N. Am. I, 314 (1803).*D. virescens* NUTT. Gen. II, 14 (1818).*D. vinineum* DON. Sweet, Brit. Fl. I, 374 (1823).*D. simplex* GRAY, Pl. Wright. II, 8 (1852).

Wats. and Coult., Gray's Man. 6 ed. 46; Webb., Fl. Neb. 116; Coult., Fl. Colo. 11; Chap., Fl. S. St. 10; Upham, Fl. Minn. 20; Mac., Fl. Can. I, 26; Coult., Fl. Tex. 9; Cov., Pl. Ark. 163; Wats., Bibl. Ind. I, 12.

North America: Man., Wis. and Minn.; S. to Fla.? and S. and W. Tex.; W. to Neb. sandhills, Colo. and Wyoming.

Minn. valley: Prairie region and sparingly in forest openings; rich banks in sunny localities, especially S.

HERB.: *Oestlund* 7 and 8, Minneapolis; *Ballard* 182, Jordan, Scott Co.; *Taylor* 633, Minnesota lake; *Sheldon* 731, Sleepy Eye; *Sheldon* 1404, Lake Benton; *Sheldon* 535, Waseca; *Ballard* 385, Jordan, Scott Co.; *Taylor* 771, Glenwood; *Herrick* 18, Minneapolis; *Kassube* 16, Minneapolis; *Holzinger* 10, Winona Co.; *Hammond* 3, Lake City; *Herb. Sheld.* 1783, Minneapolis; *Herb. Moyer.* 21, Montevideo.

Delphinium tricornе MICHX. Fl. N. Am. I, 314 (1803).

Wats. and Coult., Gray's Man. 6 ed. 46; Chap., Fl. S. St. 10; Upham, Fl. Minn. 20; Cov., Fl. Ark. 163; Wats., Bibl. Ind. I, 14; Webb., Appx. Neb. 30.

North America: Same range as *D. exaltatum* Ait.

Minn. valley: High, dry prairies S. and far S. W. in some localities. Rare.

Delphinium exaltatum AIT. Hort. Kew. II, 244 (1789).*D. urceolatum* JACQ. Icon. Rar. I, 101 (1781).*D. tridactylum* MICHX. Fl. N. Am. I, 314 (1803).

Wats. and Coult., Gray's Man. 6 ed. 46; Webb, Fl. Neb. 116; Upham, Fl. Minn. 20; Chap., Fl. S. St. 10; Wats., Bibl. Ind. I, 13.

North America: Penn. to Minn.; S. in Appalachians to N. Car.; W. to Ark. and Neb.

Minn. valley: Reported as frequent in the prairie regions. Minn. specimens have not been seen.

ANEMONE LINN. Gen. 459 (1737).

Syndesmon HOFFMG. Flora, Bl. 34 (1832).

Anemonella SPACH, Suit. Buff. VII, 240 (1839).

Barneoudia GAY, Fl. Chile I, 29 (1845).

Homalocarpus SCHUR. Enum. Transsylv. 3 (1866).

Pulsatilla TOURN. Inst. 284 (1700).

Hepatica DILL. Nov. Gen. Giess. (1719).

Baillon, *Hist. Pl.* I, 86; Benth. and Hook., *Gen. Pl.* I, 4, 953; Engler and Prantl, *Nat. Pflanz.* 3, II, 61; Durand, *Ind. Gen. Phan.* 1; Gray, *Ill. Gen.* I, 17, 19, 21; O. Kuntze, *Rev. Gen. Pl.* I, 1.

Living species: 90+; 70 (B. and H.); 85 (Durand); all extra-tropical regions and mts. in warm parts of the earth. Russia, 30; Europe, 20; European Russia, 14; America, 37; North America, 18; Canada, 16; E. Sts., 12; S. Sts., 5; Calif., 4-5; Rocky mts., 8; W. Tex., 1; Pl. Wheel., 4; Pl. King, 2-3.

Anemone thalictroides LINN. Spec. 542 (1753).

? *Thalictrum carolinianum* WALT. Fl. Car. 137 (1788).

T. anemonoides MICHX. Fl. N. Am. I, 322 (1803).

Anemone thalictroides var. *uniflora* PURSH, Fl. Am. 387 (1814).

A. walteri PURSH, l. c. 387 (1814).

Syndesmon thalictroides HOFFMSGG, Flora XV (1832).

Anemonella thalictroides SPACH, Hist. Veg. VII, 240 (1839).

Wats. and Coult., Gray's Man. 6 ed. 39; Chap., Fl. S. St. 6; Webb., Fl. Neb. 117; Britt., Fl. N. J. 34; Upham, Fl. Minn. 18; Mac., Fl. Can. I, 14, 478, II, 295; Cov., Fl. Ark. 162; Engl. Prantl, *Nat. Pflanz.* 3, II, 66; Wats., Bibl. Ind. I, 25; Britt., N. Amer. Anem. 237.

North America: S. Ontario and N. Eng. to Ga. and Fla.; W. to Dak., Neb., Kan., Mo., Ark. and Miss.

Minn. valley: Forest region; E. and N. in valley; extending to Blue Earth Co. Probably in N. and N. W. regions.

HERB.: *Holzinger* 3, Winona Co.; *Sandberg* 14, Goodhue Co.; *Herrick* 5, Minneapolis; *Holzinger* 4, Winona Co.; *Kassube* 7, Minneapolis; *Herb. Sheld.* 1829, Minneapolis.

Anemone hepatica LINN. Spec. 758 (1753).

Hepatica triloba CHAIX, Vill. Dauph. I, 336 (1786).

H. triloba var. *americana* DC. Syst. I, 216 (1818).

H. americana KER. Bot. Reg. t. 387 (1819).

Anemone americana NICH. Gard. Dict. I, 74 (1884).

Hepatica hepatica BRITT. Ann. N. Y. Acad. VI, 233 (1891).

Wats. and Coult., Gray's Man. 6 ed. 38; Britt., Fl. N. J. 34; Upham,

Fl. Minn. 18; Chap., Fl. S. St. 5; Mac., Fl. Can. I, 14, 478; Forbes and Hems., Fl. Sin. 11; Led., Fl. Ross. I, 22; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 8; Cov., Fl. Ark. 162; Engl. Prantl, Nat. Pflanz. 3, II, 61; Hart., Scand. Fl. I, 172; Britt., N. Amer. Anem. 233; Rothr., Alask. 442.

N. Russia and N. Europe to Ural Siberia, China and Saghalin.

North America: Q., N. Br., Ont. to Minn., Mo. and Ark.; S. to N. J., Va. and Fla., and W. to Miss. valley; N. W. to Hudson Strait and Sitka, Alaska.

Minn. valley: Forest region; N. and E. portions of valley; doubtless extending to New Ulm.

HERB.: *Sheldon* 79, Elysian; *Sandberg* 12, Red Wing; *Herb. Sheld.* 1830, Ramsey Co.

Anemone hepatica LINN. var. **acuta** (PURSH) HITCHCOCK, Fl. Ames 482 (1891).

Hepatica triloba var. *acuta* PURSH, Fl. Am. 391 (1814).

H. acutiloba DC. Prodr. I, 22 (1824).

Anemone acutiloba LAWSON, Tran. N. S. Inst. III, 30 (1870).

A. acuta VAIL, Mem. Torr. Club. II, 42 (1890).

Hepatica acuta BRITT. Ann. N. Y. Acad. VI, 234 (1891).

Wats. and Coult., Gray's Man. 6 ed. 38; Britt., Fl. N. J. 34; Upham, Fl. Minn. 18; Mac., Fl. Can. I, 14; Cov., Fl. Ark. 162; Wats., Bibl. Ind. I, 3; Britt., N. Amer. Anem. 234.

North America: Q., Ont. to N. Eng., N. J. and Ga.; W. to Minn., Ills., Mo. and Ark. Range more western and probably more northern than the type.

Minn. valley: Forest region, with the typical form, but rather less abundant.

HERB.: *Ballard* 198, Jordan, Scott Co.; *Herrick* 4, Minneapolis; *Kassube* 6, Minneapolis; *Sandberg* 13, Vasa; *Holzinger* 2, Winona Co.

Anemone quinquefolia LINN. Spec. 541 (1753).

A. pedata RAF. Med. Rep. V, 361 (1808).

A. minima DC. Syst. I, 206 (1818).

A. nemorosa Auct. Amer., not Linn.

A. nemorosa and var. *quinquefolia* A. GRAY, Man. ed. 5, 38 (1867).

Wats. and Coult., Gray's Man. 6 ed. 38; Coult., Fl. Colo. 4; Wats., Bibl. Ind. I, 5; Brew. and Wats., Fl. Calif. I, 4; Britt., Fl. N. J. 34; Webb., Fl. Neb. 117; Upham, Fl. Minn. 17; Chap., Fl. S. St. 4; Regel, Fl. Sib. I, 15; Mac., Fl. Can. I, 13; Led., Fl. Ross. I, 15; Max., Fl. Amur. 17; Engl. Prantl, Nat. Pflanz. 3, II, 61 (*part*); Hart., Scand. Fl. I, 172 (*part*?).

Russia and Siberia to Kamtk., Amurland and Lapland? not in Europe. China!

North America: N. Br. to Brit. Col. and Vancouver; N. to Alaska, Hudson Bay and beyond Arctic circle; N. U. S.; S. in Appalachians to Va. and Ga.; in Sierras and Coast range

to Calif.; Rocky mts. to Colo.; outside of mts. extending to Neb. and Ohio.

Minn. valley: Forest region and wooded banks; E. N. and S., extending westward on lower levels, but less abundant.

HERB.: *Sandberg 11*, Red Wing; *Kassube 5*, Minneapolis; *Herb. Wickersheim 7*, Madison Lake, Blue Earth Co. *Herb. Sheld. 1826*, Minneapolis.

***Anemone dichotoma* LINN. var. *canadensis* (LINN.).**

A. canadensis LINN. Syst. 12, III, Appx. 231 (1768).

A. pennsylvanica LINN. Mant. II, 247 (1771).

A. irregularis LAM. Enc. Meth. I, 167 (1783).

A. aconitifolia MICHX. Fl. N. Am. I, 320 (1803).

A. laxmanni STEUD. Nom. I, 96 (1840).

A. dichotoma Auct. Amer. plur., not Linn.

Wats. and Coult., Gray's Man. 6 ed. 38; Coult., Fl. Colo. 4; Webb., Fl. Neb. 117; Britt., Fl. N. J. 34; Upham, Fl. Minn. 17; Trautv., Fl. Bor.-Sib. 9 (*spec.*); Regel, Fl. O.-Sib. I, 17 (*spec.*); Led., Fl. Ross. I, 17 (*spec.*); Mac., Fl. Can. I, 13, 478; Herd., Fl. Eur. Russ. 8 (*spec.*); Wats., Bibl. Ind. I, 3; Britt., N. Amer. Anem. 227.

Eastern Russia and Siberia (the species).

North America: Anticosti and N. Br. to mouth of Mackenzie and Pac. coast; S. to N. Eng., N. J. and Penn. to Maryland; W. to Ohio, Minn., Mont., Colo., Neb. and Kan.

Minn. valley: Principally N., E. and S., but extending westward on lower levels; woodland and meadow.

HERB.: *Ballard 536*, Cleary's lake, Scott Co.; *Ballard 322*, Belle Plaine; *Leonard 1*, Washington P. O.; *Herrick 2*, St. Louis river; *Sandberg 10*, Vasa; *Herrick 3*, Minneapolis; *Kassube 4*, Minneapolis; *Taylor 781*, Glenwood; *Sheldon 1316*, Lake Benton; *Sheldon 387*, Blue Earth Co.; *Sheldon 271*, Madison Lake, Blue Earth Co.; *Taylor 139*, Janesville; *Taylor 16*, Elysian; *Ballard 7*, Chaska, Carver Co.

***Anemone virginiana* LINN. Spec. I, 540 (1753).**

A. hirsuta MOENCH, Suppl. 105 (1802).

Abelemis petiolaris RAF. Herb. Par.

Wats. and Coult., Gray's Man. 6 ed. 37; Britt., Fl. N. J. 33; Webb., Fl. Neb. 117; Upham, Fl. Minn. 17; Chap., Fl. S. St. 5; Mac., Fl. Can. I, 13, 478; Cov., Fl. Ark. 162; Engl.-Prantl, Nat. Pflanz. 3, II, 61; Wats., Bibl. Ind. I, 6; Britt., N. Amer. Anem. 223.

North America: N. Br. to Rocky mts., B. C., Vancouver; N. to lat. 55°; S. to N. Eng., Va., Ohio, Iowa, E. Neb. and Kan.

Minn. valley: Throughout; forests, forest-openings and sunny banks of streams and lakes.

HERB.: *Arthur* 163, Vermilion lake?; *Sandberg* 7, Chisago Co.?; *Sandberg* 8, Cannon Falls?; *Hall* 1, Hennepin Co.! There seems to be some confusion between *A. virginiana* and *A. dichotoma* in the Minnesota collections. *Sandberg* 9, Red Wing, labelled *A. pennsylvanica* var. seems to be a deformed *A. virginiana*. *Taylor* 424, Janesville; *Hammond* 6, Lake City; *Herb. Wickersheim* 6, Idlewild, and 7, Ash lake, Lincoln Co.; *Herb. Sheldon* 1802, Minneapolis; *Herb. Moyer* 5, Montevideo.

Anemone cylindrica A. GRAY, Ann. N. Y. Lyc. III, 221 (1836).

Wats. and Coult., Gray's Man. 6 ed. 37; Coult., Fl. Colo. 4; Britt., Fl. N. J. 33; Webb., Fl. Neb. 116; Upham, Fl. Minn. 17; Mac., Fl. Can. 13; Roth., Wheel. Exp. 56; Wats., Bibl. Ind. I, 3; Britt., N. Amer. Anem. 223.

North America: Q., Ott. to N. Eng.; W. to Rocky mts.; S. to Colo, Arizona, Neb., Kan., Mo., Iowa, Wisc., Ills. and Ohio; Brit. Col.

Minn. valley: Throughout on lower levels; in dry or sandy woodland and on banks of streams or lakes.

HERB.: *Taylor* 780, Glenwood; *Ballard* 187, Jordan; *Sheldon* 742, Sleepy Eye; *Sheldon* 363, Madison Lake; *Sheldon* 1112, Springfield; *Ballard* 568, Prior lake, Scott Co.; *Kassube* 3, Minneapolis; *Holzinger* 1, Winona; *Sandberg* 5, Goodhue Co.; *Sandberg* 6, Vasa; *Herb. Sheldon* 1803, Minneapolis; *Herb. Moyer* 4, Montevideo.

Anemone multifida POIR. Suppl. I, 364 (1810).

A. commersoniana DC. ex Deless. Ic. I, 4 (1820).

A. hudsoniana RICH. Frankl. Journ. ed. 2, Appx. 22 (1823).

A. globosa NUTT. ex Pritz. Linn. XV, 673 (1841).

A. sanguinea PURSH, ex Pritz. Linn. l. c. 672 (1841).

A. lanigera GAY, Fl. Chile I, 22 (1845).

A. narcissiflora HOOK. and ARN. Bot. Beech. 121 (1841) not Linn.

Wats. and Coult., Gray's Man. ed. 6, 37; Coult., Fl. Colo. 4; Webb., Fl. Neb. 117; Upham, Fl. Minn. 17; Brew. and Wats., Fl. Calif. I, 4; Mac., Fl. Can. I, 13, 478; Engl. Prantl, Nat. Pflanz. 3, II, 61; Roth., Wheel. Exp. 55; Wats., King Exp. 5; Wats., Bibl. Ind. I, 4; Britt., N. Amer. Anem. 222.

Chile to Magellan.

North America: Across continent in N. lat.; N. of arctic circle in E. Can.; N. Br.; Hudson Bay; Ft. Selkirk, 62° 45' N., Alaska; Brit. Col.; S. to N. W. Nebr.; N. E. Maine, Lake Superior region, Minn., Dak., Saskatchewan, Colo., mts. of S. Colo. 11,000 ft. alt., Arizona.

Minn. valley: Reported near Mendota on the rocks

at junction of Minnesota and Mississippi. Probably only far north in valley.

Anemone parviflora MICHX. Fl. N. Am. I, 319 (1803).

A. cuneifolia JUSS. Ann. Mus. III, 248 (1804).

A. trilobata PERS. Syn. II, 97 (1807).

A. borealis RICH. Frankl. Journ. ed. 2, app. 22 (1823).

A. cuneata SCHLECHT. Linn. V, 574 (1831).

A. tenella BANKS, ex Pritz. Linn. XV, 632 (1841).

Wats. and Coult., Gray's Man. 6 ed. 37; Coult., Fl. Colo. 4; Upham, Fl. Minn. 17; Mac., Fl. Can. I, 12, 477; Led., Fl. Ross. I, 16; Wats., Bibl. Ind. I, 5; Britt., N. Amer. Anem. 221; Rothr., Alask. 442.

Eastern Siberia.

North America: Lake Superior and Wisc. to mts. of Colo.; N. to Labrador, Hudson Bay, Newf., Cape Chudleigh, Alaska; Isles of Berings Strait.

Minn. valley: Reported from Minneapolis and Ft. Snelling. Forest region in N. portions of the valley.?

Anemone caroliniana WALT. Fl. Car. 157 (1788).

A. tenella PURSH, Fl. Am. II, 387 (1814).

A. hartiana RAF. Neogen. 2 (1825).

A. decapetala AUCT. AMER. plur. not Ard.

Wats. and Coult., Gray's Man. 6 ed. 37; Chap., Fl. S. Sts. 4; Coult., Fl. Colo. 4; Webb., Fl. Neb. 116; Upham, Fl. Minn. 17; Coult., Fl. Tex. 8; Prantl, in Engl. Prantl, Nat. Pflanz. III, 2, 61; Wats., King Exp. 5; Cov., Fl. Ark. 162; Wats., Bibl. Ind. I, 3; Britt., Ann. N. Y. Acad. VI, 219.

North America: Ills., Minn., Neb. to Ga., Alab., La. and Tex.

Minn. valley: Prairies and forest openings throughout; most abundant E. and S.

HERB.: *Sheldon* 1602, Pipestone City; *Leiberg* 1, Blue Earth Co.; *Sandberg* 3, Red Wing; *Sandberg* 4, Cannon Falls; *Herb. Moyer* 3, Montevideo.

Anemone hirsutissima (PURSH).

Clematis hirsutissima PURSH, Fl. Am. 385 (1814).

Anemone ludoviciana NUTT. Gen. II, 20 (1818).

A. nuttalliana DC. Syst. I, 193 (1818).

A. nuttallii NUTT. Journ. Acad. Phil. 158 (1825).

Pulsatilla nuttalliana SPRENG. Syst. II, 663 (1825).

Anemone patens HOOK. Fl. Bor. Am. I, 4 (1830) not Linn.

Pulsatilla patens A. GRAY, Ill. Gen. I, 18 (1848) not Mill.

A. patens var. *nuttalliana* A. GRAY, Man. ed. 5, 36 (1867).

A. patens var. *hirsutissima* HITCHCOCK, Pl. Ames. 482 (1891).

Pulsatilla hirsutissima BRITT. Ann. N. Y. Acad. VI, 217 (1891).

Wats. and Coult., Gray's Man. 6 ed. 37; Coult., Fl. Colo. 3; Webb., Fl. Neb. 117; Upham, Fl. Minn. 17; Mac., Fl. Can. I, 12; Roth., Wheel. Exp. 55; Wats., Bibl. Ind. I, 5; ? Regel, Fl. O.-Sib. I, 21; Britt., N. Amer. Anem. 217; Rothr., Alask. 442.

Siberia: *A. wolfgangiana* (Bess.) Trautv. Pl. Sib. Bor. 9=our plant?

North America: Man., Mich., Ills. to Mo.; W. to Colo., Mont., Saskatchewan, Brit. Col., Coast range, Mackenzie, Alaska, beyond Arctic circle; alt. of 10,500 ft. in Colo.

Minn. valley; Prairies and forest openings throughout; most abundant E. and N.

HERB.: *Oestlund* 2, Ramsey Co.; *Sandberg* 2, Goodhue Co.; *Kassabe* 2, Minneapolis; *Taylor* 745, Glenwood; *Sheldon* 1188, New Ulm; *Herb. Wickersheim* 5, Idlewild; *Herb. Univ. Hammond* 7, Lake City; *Herb. Sheldon* 1685, Minneapolis; *Sheldon* 1827, St. Paul; *Herb. Moyer* 2, Montevideo.

CLEMATIS LINN. Gen. 460 (1737).

Atragene LINN. Gen. 695 (1737).

Navarelia DC. Syst. Veg. I, 187 (1818).

Cheiropsis DC. l. c. (1818).

Meclatis SPACH, Suit. Buff. VII, 257 (1839).

Viorna PERS. Syn. I (1805).

Viticella MOENCH, Meth. (1794).

Flammula DC. l. c. (1818).

Baillon, *Hist. Pl.* I, 87; Benth. and Hook., *Gen. Pl.* I, 3; Engler and Prantl, *Nat. Pflanz.* 3, II, 62; Durand, *Ind. Gen. Phan.* 1: O. Kuntze, *Rev. Gen. Pl.* I, 2; Schenck, *Paleophyt.* 508; Gray, *Ill. Gen.* I, 13, 15.

Species: 200+ described; 66 (Kuntze); probably ± 175 ; most temperate and tropical regions. Russia, 12; Europe, 8; European Russia, 5; N. America, 25; W. Tex., 5; Calif., 4; S. Sts., 9; E. Sts., 8; R. mts., 5; Can., 4; Pl. Wheel., 4-5; Pl. King, 3.

Fossil species: Pliocene or Quaternary of Japan (*Nathorst*); Tertiary of Europe (*Ettinghausen*, *Heer*, *A. Br.*).

Clematis virginiana LINN. Amoen. 4, 275 (1755).

Clematis cordata PURSH, Fl. Am. I, 384 (1814).

Wats. and Coult., Gray's Man. 6 ed. 35; Chap., Fl. So. St. 4; Webb., Fl. Neb. 117; Britt., Fl. N. J. 33; Upham, Fl. Minn. 17; Mac., Fl. Can. I, 11. Cov., Fl. Ark. 162; Wats., Bibl. Ind. I, 11.

North America: N. S., N. Br., Q., Ont. to L. Winnipeg; S. in E. U. S. to Fla. and La.; W. to E. Neb., Ark. and N. Tex.

Minn. valley: Throughout; Fort Snelling; Shakopee; New Ulm; Morton; Glenwood; Swedes Forest; Morris; river banks, with underbrush.

HERB.: *Taylor* 839, Glenwood; *Sheldon* 939, Redwood Falls; *Ballard* 628, Chaska; *Ballard* 226, Jordan; *Sheldon* 730. Sleepy Eye; *Ballard* 750, Waconia; *Herrick* 1, Minneapolis;

Roberts 1, Sawtooth range; *Oestlund 1*, Minneapolis; *Kassube 1*, Minneapolis; *Roberts 2*, Baptism river; *Sandberg 1*, Red Wing; *Herb. Moyer 1*, Montevideo.

OXYGRAPHIS BUNGE, Fl. Atl. Suppl. 46 (1836).

Cyrtorrhynca NUTT. T. and G. Fl. I, 26 (1838).

Benth. and Hook., *Gen. Pl.* I, 6; Baillon, *Hist. Pl.* I, 39; Durand, *Ind. Gen. Phan.* 2; Engler and Prantl, *Nat. Pflanz.* 3, II, 63.

Living species: 9+; Central and Eastern Asia and N. America. Asia, 7; North America, 3?.

Oxygraphis cymbalaria (PURSH) PRANTL, Engl. Prantl, *Nat. Pflanz.* III, 2, 63 (1889).

Ranunculus cymbalaria PURSH, Fl. Am. I, 392 (1814).

R. tridentatus HBK. Nov. Gen. et Spec. V. 42 (1821).

R. sarmentosus ADANS. Mem. Mosc. IX, 244 (1839).

Wats. and Coult., Gray's Man. ed. 6, 41; Webb., Fl. Neb. 116; Britt., Fl. N. J. 36; Coult., Fl. Colo. 7; Brew. and Wats., Fl. Calif. I. 7.; Upham, Fl. Minn. 18; Regel, Fl. O.-Sib. I, 42; Mac., Fl. Can. I, 17; Forbes and Hems., Fl. Sin. I, 14; Led., Fl. Ross. I, 34; Coult., Fl. Tex. 8; Roth, Wheel. Exp. 5, 56, 354; Wats., King Exp. 7; Wats., Bibl. Ind. I, 18.

Europe; Altai and Baikal Siberia; China; S. Asia.

North America: N. J., Gt. lakes and S. Ills.; N. through Can.; Minn., Neb. to Colo. and Pac. coast; Rocky mts. far N. and S.; Rio Grande river; in sandhills of Nebraska and frequenting sandy regions along the coast, elsewhere more common in the vicinity of saline or alkaline marshes.

Minn. valley: Throughout, but principally in forest region; sandy banks, lake shores and saline grounds.

HERB: *Taylor 746*, Glenwood; *Sheldon 442*, Buffalo Lake, Waseca Co.; *Sheldon 1186*, New Ulm; *Taylor 227a*, Janesville; *Sheldon 763*, Sleepy Eye; *Taylor 638*, Minnesota Lake; *Ballard 652*, Chaska; *Sheldon 1356*, Lake Benton; *Ballard 36*, Chaska; *Holzinger 8*, Goodhue Co.; *Herb. Moyer 18*, Milan, Chippewa Co.

RANUNCULUS LINN. Gen. 464 (1737).

Batrachium SPACH, Suit. Buff. VII, 199 (1839).

Pachyloma SPACH, l. c. 194 (1839).

Cyprianthe SPACH, l. c. 220 (1839).

Ceratocephalus MOENCH, Meth. 218 (1794).

Xiphocoma and **Gampsoceras** STEV. Bull. Mosc. (1852).

Hecatonia and **Krapfia** DC. Syst. Veg. I, 227, 228 (1818).

Casalea and **Aphanostemma** ST. HIL. Fl. Bras. I, 8, 12 (1825).

Ficaria DILL. Nov. Gen. Giess. 108 (1719).

Baillon, *Hist. Pl.* I, 86; Benth. and Hook., *Gen. Pl.* I, 5, 953; Engler and Prantl, *Nat. Pflanz.* 3, II, 64; Durand, *Ind. Gen. Phan.* 2; O. Kuntze, *Rev. Gen. Pl.* I, 3; Gray, *Ill. Gen.* I, 29; Schenck, *Palaeophyt.* 508.

Living species: 250+; 160 (B. and H.); 200 (Durand); cosmopolitan, but richest in northern, extra-tropical regions; Russia, 70; Europe, 94; European Russia, 37; North America, 60+; Canada, 42-47; Calif., 20-24; E. Sts., 18; Rocky mts., 22; S. Sts., 15; W. Tex., 8; Pl. Wheel., 18; Pl. King, 20.

Fossil species: 1; Tertiary of Europe (*Heer*).

***Ranunculus pensylvanicus* LINN. f. Suppl. 272 (1781).**

R. canadensis JACQ. Misc. 11, 343 (1778).

R. trifolius MOENCH, Suppl. 70 (1802).

R. hispidus PURSH, Fl. Am. I, 395 (1814).

R. hirsutus CURT. Eat. Man. IV, 424 (1825) ?

Wats. and Coult., Gray's Man. 6 ed. 43; Britt., Fl. N. J. 37; Webb., Fl. Neb. 116; Chap., Fl. S. St. 8; Coult., Fl. Colo. 8; Mac., Fl. Can. I, 21; Forbes and Hems., Fl. Sin. I, 14; Cov., Fl. Ark. 163; Wats., Bibl. Ind. I, 22.

China.

North America: N. S., N. Br., Ont. to Brit. Col. and Pac.; N. in arctic circle; S. to N. Eng., N. J., Penn. and Va.; W. to Minn., Dak., Neb., Colo. Mont.; B. Col. to Oregon.

Minn. valley: Forest region, especially E. and N. in valley; damp woodland and openings.

HERB.: *Ballard* 812, Page lake, Carver Co.; *Ballard* 695, Waconia; *Ballard* 737, Waconia; *Sheldon* 1255, Lake Benton; *Taylor* 115, Janesville; *Ballard* 489, Prior's lake, Scott Co.; *Taylor* 827, Glenwood; *Ballard* 532, Cleary's lake, Scott Co.; *Taylor* 981, Glenwood; *Oestlund* 5, Hennepin Co.; *Herrick* 13, Minneapolis; *Roberts* 4, Grand Marais; *Roberts* 5, Duluth; *Holzinger* 7, Winona Co.; *Bailey* 71, Vermilion lake; *Sandberg* 28, Red Wing; *Herb. Moyer*. 12, Montevideo.

***Ranunculus repens* LINN. Spec. 779 (1753).**

R. prostratus POIR. Enc. Meth. VI, 113 (1804).

R. tomentosus POIR. Enc. Meth. VI, 127 (1804).

R. intermedius EAT. Man. ed. 3, 424 (1822).

R. clintoni BECK, Bot. 9 (1833).

Wats. and Coult., Gray's Man. 43; Britt., Fl. N. J. 37; Hook., Fl. Gt. Brit. 9; Mac., Fl. Can. I, 21, 481; Forbes and Hems., Fl. Sin. I, 16; Led., Fl. Ross. I, 44, 733; Nym., Fl. Eur.; Herd., Fl. Eur. Russ., 10; Coult., Fl. Tex. 8; Wats., King Exp. 9; Wats., Bibl. Ind. I, 22; Hart., Fl. Scand. I, 163.

Northern Eur. and Africa; Siberia and China.

North America: Introduced eastward, but probably indigenous west of the great lakes; Ont. to Brit. Col.; S. to Tex., Arizona, Minn., Iowa, Ohio.

Minn. valley: Plants of the true *R. repens* have been found at Ft. Snelling, where the species is possibly indigenous. Habitat like that of *R. septentrionalis* Poir. This is undoubtedly a rare plant in the Minn. valley.

HERB.: ? *Herrick* 15, Minneapolis; ? *Sandberg* 32, Red Wing.

Ranunculus septentrionalis POIR. Enc. Meth. VI, 123 (1804).

R. hispidus MICHX. Fl. N. Am. I, 321 (1803).

R. marilandicus POIR. Enc. Meth. VI, 126 (1804).

R. nitidus MUHL. Cat. ed. 2, 56 (1818).

R. carolinianus DC. Syst. 1, 292 (1818).

R. schlehtendahlui HOOK. Fl. Bor.-Am. I, 21 (1833).

R. repens LINN. var. *hispidus* T. and G. Fl. I, 658 (1838).

R. repens LINN. var. *nitidus* T. and G. Fl. I, 658 (1838).

R. repens Auct. Amer. in part.

Wats. and Coult., Gray's Man. ed. 6, 43; Britt., Fl. N. J. 37; Coult., Fl. Colo. 8; Chap., Fl. S. St. 8; Brew. and Wats., Fl. Calif. 8; Upham, Fl. Minn. 19; Mac., Fl. Can. I, 21, 22; Nym., Fl. Eur.; Led., Fl. Ross. I, 44; Griseb., Fl. W. I.; Wats., King Exp. 9; Mac., Fl. Can. II, 298; Herd., Fl. Eur. Ross. 10; Coult., Fl. Tex. 9; Cov., Fl. Ark. 163; Wats., Bibl. Ind. I, 23.

Europe; Mid. Russ.; Siberia; Kamtk.

North America: Anticosti; N. S., N. Br. to Hudson Bay and Pac.; N. to lat. 67°; across the cont. southward; Atl. to Tex. and in Rocky mts. to lat. 52°. It is not clear that the foreign plant is this species. The long confusion with *R. repens* makes the accurate separation of the two plants a task which can not be undertaken without abundant material from the different regions.

Minn. valley: Most of what has passed for *R. repens* Linn. and all of *R. repens* Linn. var. *hispidus* (Michx.) is undoubtedly this species. Moist and shady places or wet meadows; damp woodland and near springs.

HERB.: *Ballard* 174, Shakopee; *Sandberg* 31, White Rock; *Kassube* 13, Minneapolis; *Herrick* 14, Minneapolis; *Herb. Moyer* 13, Montevideo; 14, Montevideo; 15, Montevideo; 16, Milan, Chippewa Co.; *Herb. Sheldon* 1774, Ft. Snelling.

Ranunculus fascicularis MUHL. Bigel. Fl. Bost. 137 (1814).

Wats. and Coult., Gray's Man. 6 ed. 43; Britt., Fl. N. J. 37; Upham, Fl. Minn. 19; Mac., Fl. Can. I, 18; Coult., Fl. Tex. 9; Wats., King Exp. 9; Cov., Fl. Ark. 162; Wats., Bibl. Ind. I, 18.

North America: Ont. to L. Winnipeg; E. U. S. to Va.; W. to Minn., Mo., Ark., Tex.

Minn. valley: Hills and banks in more exposed localities; Ft. Snelling and probably westward to New Ulm.

HERB.: *Sandberg* 29, Vasa; *Sandberg* 30, Cannon Falls; *Herb. Sheld.* 1678, Minneapolis; 1822, Minneapolis.

Ranunculus recurvatus POIR. Enc. Meth. VI. 123 (1804).*R. lanuginosus* WALT. Fl. Car. 157 (1788).*R. saniculaeformis* MUHL. Cat. 56 (1813).*R. leptopetalus* RAF. Fl. Lud. 83 (1817).*R. fascicularis* SPRENG. Neu. Entd. I, 228 (1820).

Wats. and Coult., Gray's Man. 6 ed. 43; Britt., Fl. N. J. 37; Webb., Fl. Neb. 116; Chap., Fl. S. St. 8; Upham, Fl. Minn. 19; Mac., Fl. Can. I, 19, 480; Led., Fl. Ross. I, 44; Rothr., Wheel. Exp. 58; Cov., Fl. Ark. 163; Wats., Bibl. Ind. I, 22.

Arctic islands off the coast of N. E. Siberia.

North America: Labrador, N. S., N. Br., Q., Ont. to L. Winnipeg; S. along Atl. coast; W. to Minn., Neb., Mo. and Ark.

Minn. valley: Forest region; E. and N. in valley; woods and shaded banks.

HERB.: *Ballard* 147, Chaska; *Sandberg* 27, Chisago Co.; *Leiberg* 3, Blue Earth Co.; *Kassube* 12, Minneapolis; *Herb. Sheld.* 1819, Ramsey Co.

Ranunculus sceleratus LINN. Spec. 776 (1753).

Wats. and Coult., Gray's Man. 6 ed. 42; Britt., Fl. N. J. 37; Webb., Fl. Neb. 116; Upham, Fl. Minn. 19; Chap., Fl. S. St. 8; Coult., Fl. Colo. 7; Hook., Fl. Gt. Brit. 9; Mac., Fl. Can. I, 19; Forbes and Hems., Fl. Sin. I, 16; Led., Fl. Ross. I, 45; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 10; Engl. Prantl, Nat. Pflanz. III, 2, 65; Brew. and Wats., Fl. Calif. I, 426; Roth., Wheel. Exp. 57; Wats., King Exp. 8; Cov., Fl. Ark. 163; Wats., Bibl. Ind. I, 23; Hart., Fl. Scand. I, 165.

Northern Eur.; N. Asia to India and Bengal; China; Siberia.

North America: Maritime provinces of Can. to Brit. Col., Peace river and lat. 67° N.; S. throughout U. S.

Minn. valley: Banks of streams; ditches; wet spring sides, N. E. and S. in valley, extending far W. on lower levels.

HERB.: *Sheldon* 701, Waseca—*dwarf form*; *Ballard* 47, Chaska; *Ballard* 474, Prior's lake, Scott Co.; *Sheldon* 183, Eagle lake, Blue Earth Co.; *Taylor* 506, Minnesota lake; *Ballard* 324, Belle Plain; *Kassube* 14, Minneapolis; *Herrick* 16, Minneapolis; *Oestlund* 6, Hennepin Co.; *Sandberg* 33, Vasa; *Herb. Moyer* 17, Montevideo.

Ranunculus abortivus LINN. Spec. 551 (1753).*R. nitidus* WALT. Fl. Car. 159 (1788).

Wats. and Coult., Gray's Man. ed. 6, 42; Coult., Fl. Colo. 7; Webb., Fl. Neb. 116; Britt., Fl. N. J. 36; Chap., Fl. S. St. 7; Upham, Fl. Minn. 19; Mac., Fl. Can. I, 18; Cov., Fl. Ark. 162; Wats., Bibl. Ind. I, 15.

North America: Man. to Brit. Col.; in U. S., Atl. coast to Rocky mts.

Minn. valley: Forest region and wooded banks; openings and moist soil, especially E. in valley.

HERB.: *Ballard* 125, Chaska; *Taylor* 275, Janesville; *Sheldon* 140, Madison Lake; *Sheldon* 36, Elysian; *Herrick* 12, Minneapolis; *Holzinger* 6, Winona Co.; *Kassube* 11, Minneapolis; *Sandberg* 26, Red Wing; *Roberts* 3, Black Point; *Oestlund* 4, Minneapolis; *Herb. Sheld.* 1820, Minneapolis.

Ranunculus abortivus LINN. var. **micranthus** (NUTT.) GRAY, Man. 5 ed. 42 (1867).

R. micranthus NUTT. T. and G. Fl. I, 18 (1838).

Wats. and Coult., Gray's Man. 6 ed. 42; Britt., Fl. N. J. 36; Upham, Fl. Minn. 19; Mac., Fl. Can. I, 18, 480; Cov. Fl. Ark. 162; Wats. Bibl. Ind. I, 15.

North America: Eastern Canadian provinces? N. shore of Lake Superior to Brit. Col.; Mass. and N. J. to Minn., Dak. and Colo.

Minn. valley: With typical form, especially W. and S. W.; apparently less abundant than the type.

HERB.: *Moyer* 11, Montevideo.

Ranunculus ovalis RAF. Journ. Bot. 268 (1814).

R. rhomboideus GOLDIE. Edin. Phil. Journ. VI, 329 (1822).

R. brevicaulis HOOK. Fl. Bor.-Am. I, 13 (1833).

Wats. and Coult., Gray's Man. 6 ed. 42; Coult., Fl. Colo. 7; Webb., Fl. Neb. 116; Upham, Fl. Minn. 19; Mac., Fl. Can. 17; Wats., Bibl. Ind. I, 23.

North America: Q. to Man. and Brit. Col.; N. in Rocky mts. to lat 52°; S. to Mich., Ills., Wisc., Minn. and N. and W. Neb.

Minn. valley: Low prairies and near edges of sloughs; valley throughout; principally N. E. and S..

HERB.: *Sheldon* 942, Redwood Falls; *Menzel* 1, Pipe stone City; *Kassube* 10, Minneapolis; *Leiberg* 2, Blue Earth Co. ?; *Sandberg* 24, Red Wing; *Sandberg* 25, Cannon Falls; *Herb. Sheld.* 1679, Minneapolis; 1821, Ft. Snelling; *Herb. Moyer* 9, Montevideo; 10, Montevideo.

Ranunculus pedatifidus SM. Rees Cycl. 72 (1819).

R. affinis R. BR. Parr. 1st Voy. Appx. 265 (1823).

R. amoenus LED. Fl. Alt. I, 320 (1829).

R. auricomus var. *affinis* LAWSON, Ran. Can. (1876).

Wats. and Coult., Gray's Man. 6 ed. 42; Coult., Fl. Colo. 8; Upham, Fl. Minn. 19; Mac., Fl. Can. I, 18; Led., Fl. Ross. I, 37; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 10; Roth., Wheel. Exp. in var. 57; Wats., King Exp. 7; Wats., Bibl. Ind. I, 15.

Europe; Altai, Baikal and Transbaik. Siberia.

North America: Greenland, Melville Isl. to Rocky mts., 52° N. lat., Brit. Col. and N. W. T.; S. in mts. to Colo. and

Nevada; E. from Montana to Minn., Iowa and Canada; Hudson strait.

Minn. valley: S. and S. W. in valley; damp woodland and near springs. Rather rare.

HERB.: *Sheldon* 781, Sleepy Eye; *Taylor* 431, Janesville; *Sheldon* 1568, Lake Benton; *Sheldon* 1189, New Ulm.

***Ranunculus reptans* LINN.** Spec. 549 (1753).

R. filiformis MICHX. Fl. N. Am. I, 320 (1803).

R. reptans var. *filiformis* DC. Syst. 1, 248 (1818).

R. flammula LINN. var. *reptans* E. MEYER, Pl. Lab. 96 (1830).

R. flammula var. *filiformis* HOOK. Fl. Bor.-Am I, 11 (1833).

Wats. and Coult., Gray's Man. 6 ed. 42; Britt., Fl. N. J. 36; Coult., Fl. Colo. 6; Brew. and Wats., Fl. Calif. I, 6; Upham, Fl. Minn. 18; Mac., Fl. Can. I, 17; Nym., Fl. Eur.; Mac., Fl. Can. II, 297; Herd., Fl. Eur. Russ. 10; Roth, Wheel. Exp. 56; Wats., King Exp. 7; Wats., Bibl. Ind. I, 18; Led., Fl. Ross. I, 32; Trautv., Fl. Sib. 9; Hart., Fl. Scand. I, 161.

Scotland; N. Eur.; Siberia.

North America: Greenland and Nova Scotia to Brit. Col. and Coast range; S. in Calif. at alt. 6,000 ft.; local in Colo.; S. to Minn., Iowa, New Eng., N. J., Penn., Ohio and Ills.

Minn. valley: Forest region, especially N. and S. E.; gravelly or sandy beaches of lakes and streams.

HERB.: *Sheldon* 214, Lake Ballentyne, Blue Earth Co.; *Sheldon* 102, Elysian; *Ballard* 829, Page Lake, Carver Co.; *Herrick* 9, Minneapolis; *Herrick* 10, Excelsior; *Bailey* 1000, White Bear lake; *Sandberg* 22, Chisago Co.; *Sandberg* 23, Chisago Co.; *Herrick* 11, Minneapolis; *Kassube* 9, Cedar lake, Hennepin Co.

***Ranunculus ambigens* S. WATS.** Ind. N. A. Bot. 16 (1878).

? *R. lingua* PURSH, Fl. Am. 391 (1814).

R. flammula PURSH, Fl. Am. 391 (1814) not DC.

? *R. robini* RAF. Fl. Lud. 82 (1817).

R. alismaefolius GRAY, Man. 2d ed. 8 (1852).

Wats. and Coult., Gray's Man. 6 ed. 41; Chap., Fl. S. St. 7; Britt., Fl. N. J. 63; Brew. and Wats. Fl. Calif. I, 6?; Mac., Fl. Can. I, 16, 480; Wats., King Exp. 7?; Wats. Bbl. Ind. I, 16.

Europe?

North America: N. Eng. to Minn., Dak., Brit. Col., Vancouver; S. to N. J., Ohio, Tenn.; southward.

Minn. valley: Reported from the lake region of Alexandria and probably N. in valley; rare; in wet mud.

***Ranunculus lacustris* BECK and TRACY,** Eat. Man. ed. 3 423 (1822).

R. multifidus PURSH, Fl. Am. I, 736 (1814) not Forsk.

R. multifidus BIGEL. Fl. Bost. ed. 2, 228 (1824)?

R. fluviatilis BIGEL. Fl. Bost. 139 (1840) *not* Willd.

R. purshii RICH. Frankl. Journ. 13 (1823).

R. limosus NUTT. T. and G. Fl. I, 20 (1838).

R. radicans C. A. M. var. *multifidus* REGEL, Fl. Ost Sib. I, 45 (1862).

Wats. and Coult., Gray's Man. 6 ed. 41; Britt., Fl. N. J. 36; Webb., Fl. Neb. 116; Upham, Fl. Minn. 18; Coult., Fl. Colo. 9; Mac., Fl. Can. I, 16; Engl. Prantl, Nat. Pflanz. III, 2, 65; Brew. and Wats., Fl. Calif. I, 426; Wats., King Exp. 8; Roth, Wheel. Exp. 57,? Cov., Fl. Ark. 163; Wats., Bibl. Ind. I, 20; Rothr., Alask. 442.

Siberia.

North America: Cape Breton Isles. to Pac.; N. S. to N. W. T. and Alaska; S. to N. Eng., N. J., Penn., Ohio, Iowa, Mo., Minn. and Colo.; Utah and Calif.

Minn. valley: Throughout in ponds, lakes and sluggish streams.

HERB.: *Ballard* 10, Chaska; *Sheldon* 437, Buffalo lake, Waseca Co.; *Ballard* 430, Prior's lake; *Sheldon* 441, Smith's Mills, Blue Earth Co.; *Sheldon* 257, Turtle lake, Le Sueur Co.; *Taylor* 731, Glenwood; *Sandberg* 20, Chisago lake; *Kassube* 8, Minneapolis; *Herrick* 8, Minneapolis; *Sandberg* 21, Red Wing; *Arthur* 95, Vermilion lake; *Herb. Wickersheim* 9, Norwegian creek, Lincoln Co.

***Ranunculus lacustris* BECK and TRACY, var. *terrestris* (GRAY).**

R. multifidus var. *terrestris* GRAY, Man. ed. v. 41 (1867).

Wats. and Coult., Gray's Man. 6 ed. 41; Mac., Fl. Can. I, 16, II, 297.

North America: N. Ohio; Ills., Minn., Man. to Saskatchewan, Dak., N. W. T. and Brit. Col.

Minn. valley: Forest district; rooting in mud near pools or ponds.

HERB.: *Sheldon* 10, Waterville, Le Sueur Co.; *Bailey* 95a, Vermilion lake; *Bailey* 441, Fall lake.

***Ranunculus aquatilis* LINN. var. *trichophyllus* (CHAIX.) GRAY, Man. 5 ed. 40 (1867).**

R. trichophyllus CHAIX. Vill. Dauph. I, 336 (1786).

R. fluviatilis PURSH, Fl. Am. I, 395 (1814.)

R. aquatilis var. *capillaceus* DC. Prodr. I, 26 (1824).

R. hydrocharis trichophyllus HIERN. Seem. Journ. Bot. IX, 101 (1871).

Wats. and Coult., Gray's Man. 6 ed. 40; Coult., Fl. Colo. 6; Webb., Fl. Neb. 116; Britt., Fl. N. J. 35; Chap., Fl. S. St. 7; Upham, Fl. Minn. 18; Brew. and Wats., Fl. Calif. I, 5; Hook., Fl. Gt. Brit. 6; Mac., Fl. Can. I, 16; Forbes and Hems., Fl. Sin. 13; Herd., Fl. Russ. Eur. 8; Engl. Prantl, III, 2, 65; Wats., King. Exp. 5; Roth., Wheel. Exp. 354; Wats., Bibl. Ind. I, 17; Hart., Fl. Scand. I, 167.

Europe; W. Asia; China; Himalayas; Australia; almost cosmopolitan.

North America: Greenland to Brit. Col. in Can.; U. S. across the continent; mts. of Utah to 6,000 ft. alt.

Minn. valley: Abundant throughout in ponds, lakes and sluggish streams.

HERB.: *Ballard* 170, Shakopee; *Sheldon* 317, Madison Lake; *Sheldon* 1152, New Ulm; *Sheldon* 1136, Springfield; *Sheldon* 722, Sleepy Eye; *Ballard* 277, Jordan; *Holzinger* 5, Lake Winona; *Huntington* 1, Rock Co.; *Sandberg* 19, Cannon Falls; *Herb. Wickersheim* 8, Lake Stay, Lincoln Co.; *Herb. Moyer* 8, Granite Falls.

Ranunculus aquatilis LINN. var. **caespitosus** DC. Prodr. I, 26 (1824).

R. hydrocharis caespitosus HIERN. Seem. Journ. Bot. IX, 65 (1871).

Wats. and Coult., Gray's Man. 6 ed. 41; Wats., Bibl. Ind. I, 17; Mac., Fl. Can. I, 16.

North America: Ont. to Ill., Minn., Dak. and Saskatchewan.

Minn. valley: S. and S. W. districts; pools of stagnant water and rooting in the mud.

HERB.: *Sheldon* 818, Cottonwood river, near Sleepy Eye; *Sheldon* 1134, Cottonwood river, Springfield; *Sheldon* 317, Duck lake, Blue Earth Co.; *Sheldon* 354, Lake Madison, Blue Earth Co.; *Sheldon* 435, Lake Elysian, Waseca Co.; *Sheldon* 1452, Pipestone.

Ranunculus circinnatus SIBTH. Fl. Oxon. (1794).

R. aquatilis LINN. var. *stagnatilis* DC. Prodr. I, 26 (1824).

R. divaricatus GRAY, Pl. Wright, II, 8 (1852).

Wats. and Coult., Gray's Man. 6 ed. 40; Upham, Fl. Minn. 18; Coult., Fl. Colo. 6; Mac., Fl. Can. I, 16; II, 296; Wats., Bibl. Ind. I, 17; Wats., King Exp. 6; Hook., Fl. Gt. Brit. 6; Nym., Fl. Eur.; Hart, Fl. Scand. I, 168; Webb., Appx. Neb. 30.

W. Europe (local).

North America: Man. to Rocky mts. and Brit. Col.; S. to Vt., Maine, Iowa, Dak., Neb., Colo., Nev. and Oregon.

Minn. valley; Reported from Mankato and Alexandria; probably local in the forest lakes of the valley.

HERB.: *Bailey* 318, Vermilion lake.

THALICTRUM LINN. Gen. 461 (1737).

Physocarpum SPACH, Suit. Buff. VII, 237 (1839).

Tripterium SPACH, l. c. (1839).

Baillon, *Hist. Pl.* I, 87; Benth. and Hook., *Gen. Pl.* I, 4; Engler and

Prantl, *Nat. Pflanz.* 3, II, 66; Durand, *Ind. Gen. Phan.* 1; O. Kuntze, *Rev. Gen. Pl.* I, 4; Gray, *Ill. Gen.* I, 23.

Living species: 76±; 50 (B. and H.); 70 (Durand); Europe; Asia; Africa; N. and S. America; extra-tropical. Russia, 28; Europe, 26; European Russia, 12; North America, 14-16; Canada, 9; S. Sts., 6; E. Sts., 4; W. Tex.; 3; Rocky mts., 5; Calif., 4; Pl. Wheel., 2; Pl. King, 4.

***Thalictrum purpurascens* LINN. Spec. 546 (1753).**

T. rugosum AIT. Hort. Kew. 2, 262? (1811).

T. pubescens PURSH, Fl. Am. I, 388 (1814).

T. revolutum DC. Syst. I, 173 (1818).

T. cornuti T. and G. Fl. I, 38 (1838).

Wats. and Coult., Gray's Man. 6 ed. 39; Britt., Fl. N. J. 35; Webb., Fl. Neb. 117; Upham, Fl. Minn. 18; Mac., Fl. Can. I, 14, 479; II, 298; Cov., Fl. Ark. 162; Coult., Fl. Tex. 7; Wats., Bibl. Ind. I, 26.

North America: N. S., Anticosti, Q., Ont. to N. Eng., N. J., Md.; W. to Minn., Dak., Neb., Mo. and Ark., W. Tex.

Minn. valley: Throughout in forest region and on wooded banks, with *T. dioicum*; rather more abundant, especially westward. This species has been mistaken for *T. polygamum*.

HERB.: *Sheldon* 1299, Lake Benton; *Ballard* 373, Helena, Scott Co.; *Ballard* 162, Chaska; *Taylor* 331, Janesville; *Sheldon* 767, Sleepy Eye; *Taylor* 571, Minnesota lake; *Taylor* 843, Glenwood; *Taylor* 1721, Janesville; *Sheldon* 968, Sleepy Eye; *Herrick* 6, Minneapolis; *Sandberg* 18, Cannon Falls; *Gedge* 1, Glyndon; *Herrick* 7, Minneapolis; *Bailey* 460, Agate Bay; *Arthur* 68, Vermilion lake; *Bailey* 448, Mud river; *Herb. Sheld.* 1735, Minneapolis; *Herb. Moyer* 7, Montevideo.

***Thalictrum dioicum* LINN. Spec. 545 (1753).**

T. laevigatum MICHX. Fl. N. Am. I, 322 (1803).

Wats. and Coult., Gray's Man. 6 ed. 39; Britt., Fl. N. J. 35; Chap., Fl. S. St. 5; Upham, Fl. Minn. 18; Mac., Fl. Can. I, 14, 479; Engl. Prantl, *Nat. Pflanz.* III, 2, 66; Wats., Bibl. Ind. I, 25.

North America: N. Br., Anticosti and N. S. to Pac.; N. to lat. 67°; S. to Minn., Ohio, and in Appalachians to N. Car.

Minn. valley: Forest region, in dry localities, throughout; wooded banks and openings.

HERB.: *Sheldon* 237, Turtle lake, Le Sueur Co.; *Sheldon* 50, Elysian; *Taylor* 33, Elysian; *Oestlund* 3, Ramsey Co.; *Sandberg* 15, Red Wing; *Sandberg* 16, Vasa; *Sandberg* 17, Cannon Falls; *Herb. Sheld.* 1824, Hennepin Co.; *Herb. Moyer* 6, Montevideo.

XLII. BERBERIDACEAE. Barberry Family.

Endlicher, *Gen. Pl.* 852 (1840); Benth. and Hook., *Gen. Pl.* I, 40 (1862); Prantl, in *Engler and Prantl, Nat. Pflanz.* 3, II, 70 (1888).

Genera: 8; principally extra-tropical regions of N. hemisphere and centering on the Pacific coast regions of the Old and New worlds; a few in tropical Asia and the Andes district.

Species: 135; 75 per cent. in genus *Berberis*.

PODOPHYLLUM LINN. Gen. 426 (1737).

Anapodophyllum TOURN. Inst. 239 (1700).

Baillon, *Hist. Pl.* III, 75; Benth. and Hook., *Gen. Pl.* I, 45; Durand, *Ind. Gen. Phan.* 10; Engler and Prantl, *Nat. Pflanz.* 3, II, 74; Gray, *Ill. Gen.* I, 87.

Living species: 5; 2 (Durand); North America and Japan, 1; Himalayas, 1; S. China and Formosa, 2-3.

Podophyllum peltatum LINN. Spec. 505 (1753).

Anopodophyllum peltatum MOENCH, Meth 277 (1794).

P. odophyllum callicarpum RAF. Fl. Lud. 14 (1817).

P. montanum RAF. Med. Fl. II, 59 (1830).

Wats. and Coult., Gray's Man. 6 ed. 54; Britt., Fl. N. J. 42; Webb., Fl. Neb. 115; Chap., Fl. S. St. 18; Upham, Fl. Minn. 21; Mac., Fl. Can. I, 30; Engl. Prantl, *Nat. Pflanz.* III, 2, 74; Cov., Fl. Ark. 164; Wats., *Bibl. Ind.* I, 35.

Japan.

North America: N. Eng. and Ont. to Fla.; W. to Minn., Neb., Kan. and Ark.

Minn. valley: S. E. region only; rich woodlands, not common.

HERB.: Sheldon 7, Faribault; Sandberg 43, Pine Island

LEONTICE LINN. Gen. 268 (1737).

Bongardia C. A. M. Verz. Pfl. Cauc. (1831).

Gymnospermium SPACH, Suit. Buff. VIII, 66 (1839).

Caulophyllum MICHX. Fl. Bor. Am. I, 204 (1803).

Leontopetalum TOURN. Corr. 484 (1703).

Baillon, *Hist. Pl.* III, 74; Benth. and Hook., *Gen. Pl.* I, 43; Engler and Prantl, *Nat. Pflanz.* 3, II, 76; Durand, *Ind. Gen. Phan.* 10; Gray, *Ill. Gen.* 81.

Living species: 10-12; 5-6 (B. and H.); 10 (Durand) S. Europe, middle Asia, Manchuria, Japan and North America

Leontice thalictroides LINN. Spec. 312 (1753).

Caulophyllum thalictroides MICHX. Fl. N. Am. I, 205 (1803).

Wats. and Coult., Gray's Man. 6 ed. 53; Britt., Fl. N. J. 42; Chap., Fl. S. St. 17; Upham, Fl. Minn. 21; Mac., Fl. Can. I, 30, 483; Wats., *Bibl. Ind.* I, 35; Engl. Prantl, *Nat. Pflanz.* III, 2, 76; Webb., Appx. Neb. 30.

Japan and Manchuria.

North America: N. Br., Q., Ont. to N. Y., N. J., Penn. and S. Car. W. to Ohio, Minn., Neb. and Man.

Minn. valley: Throughout in deep woodland, especially along streams and near lakes.

HERB. *Sheldon* 802, Sigel township, Brown Co.; *Taylor* 890, Glenwood; *Sheldon* 142, Madison Lake; *Sheldon* 54, Elysian; *Ballard* 76, Chaska; *Kassube* 18, Minneapolis; *Leiberg* 6, Blue Earth Co.; *Holzinger* 11, Winona Co.; *Sandberg* 42, Red Wing; *Herb. Sheld.* 1714, Minneapolis; 1862, Ramsey Co.; *Herb. Wickersheim* 10, Ash lake, Lincoln Co.; *Herb. Moyer* 24, Carlton lake, Chippewa Co.

XLIII. MENISPERMACEAE. Moon-Seed Family.

Endlicher, *Gen. Pl.* 825 (1840); Benth. and Hook., *Gen. Pl.* I, 30 (1862); Prantl, *Engler and Prantl, Nat. Pflanz.* 3, II, 78 (1888).

Genera: 56-58 living; 5-6 extinct; tropics and sparingly without, especially in the S. hemisphere; in the Tertiary widely distributed over the N. hemisphere.

Species: 300 (*Miers*); 80 (B. and H.); perhaps 150 distinct; Cretaceous and Tertiary forms abundant in N. America and Tertiary forms in Europe, where there are now few living representatives.

MENISPERMUM LINN. Gen. 107 (1737).

Trilophos FISCH. Ann. Sci. Nat. (1835).

? *Selwynnia* F. MULL. Fragm. IV, 153 (1861?).

Baillon, *Hist. Pl.* III, 33; Benth. and Hook., *Gen. Pl.* I, 37, 962; Durand, *Ind. Gen. Phan.* 8; Gray, *Ill. Gen.* I, 73; Schenck, *Paleophyt.* 500.

Living species: 3. Japan, 1; Centr. and E. Asia, 1; North American Atl. forest region, 1.

Fossil species: *Menispermities* (*Lesquerx.*) about 10 species from the Dakota, Cretaceous (upper) and 5-6, Eocene North America.

Menispermum canadense LINN. Spec. 340 (1753).

Cissampelos smilacina LINN. Spec. 2 ed. 1473 (1762).

M. angulatum MOENCH, Meth. 277 (1794).

M. smilacinum DC. Syst. I, 541 (1818).

Wats. and Coult., Gray's Man. 6 ed. 51; Britt., Fl. N. J. 42; Webb. Fl. Neb. 115; Upham, Fl. Minn. 21; Chap., Fl. S. St. 16; Mac., Fl. Can. I, 29; Cov., Fl. Ark. 163; Wats., Bibl. Ind. I, 32.

North America: Q., Ont. and Man.; N. U. S. to N. Eng., N. J. and N. Car.? W. to Dak., Minn., Neb. and Ark.

Minn. valley: Throughout; wooded banks of lakes and streams, climbing over shrubbery.

HERB.: *Taylor* 980, Glenwood; *Ballard* 102, Chaska; *Sheldon* 30, Elysian; *Sheldon* 636, Wilton, Waseca Co.; *Taylor* 707, Minnesota lake; *Oestlund* 10, Minneapolis; *Sandberg* 41, Red Wing; *Herb. Moyer* 23, Montevideo.

XLIV. PAPAVERACEAE. Poppy Family.

Endlicher, *Gen. Pl.* 854 (1840); Benth, and Hook., *Gen. Pl.* I, 49 (1862); DC. *Syst.* II, 67 (1821)—*Fumariaceae*; Prantl and Kündig, *Engler and Prantl, Nat. Pflanz.* 3, II, 130 (1889).

Genera: 28; temperate and warmer regions; principally in N. temperate floral region; centers of distribution (1) Central and E. Asia; (2) Pacific North America; (3) Mediterranean region.

Species: $250 \pm$; 35 per cent. in genus *Neckeria*.

SANGUINARIA LINN. Gen. 425 (1737).

Belharnosia SARRAC. ex Adans. *Fam. Pl.* (1763).

Baillon, *Hist. Pl.* III, 141; Benth. and Hook., *Gen. Pl.* I, 53; Engler and Prantl, *Nat. Pflanz.* 3, II, 139 (Prantl and Kündig); Durand, *Ind. Gen. Phan.* 11; Gray, *Ill. Gen.* 115.

Living species: 1; woodlands of Atlantic North America.

Fossil species: (*Papaveraceae*) Schenck, *Palaeophyt.* 515, Lignitic in Saxony; doubtful.

Sanguinaria canadensis LINN. Spec. 505 (1753).

S. acaulis MOENCH, *Meth.* 227 (1794).

S. vernalis SALISB. *Prodr.* 377 (1796).

Wats. and Coult., *Gray's Man.* 6 ed. 58; Britt., *Fl. N. J.* 45; Chap., *Fl. S. St.* 22; Upham, *Fl. Minn.* 23; Mac., *Fl. Can.* I, 34; Engl. Prantl and Kündig, *Nat. Pflanz.* III, 2, 139; Cov., *Fl. Ark.* 164; Wats. *Bibl. Ind.* I, 43.

North America: N. S., N. Br., Q., Ont., to Man. and N. Dak., S. to N. Eng., N. J. and Fla.; W. to Minn. and Ark.

Minn. valley: Forest region and wooded banks to Montevideo and Glenwood; rare far W.; open woodland and shady banks.

HERB.: *Ballard* 86, Chaska; *Taylor* 129, Janesville; *Sheldon* 26, Elysian; *Herrick* 24, Minneapolis; *Arthur* 157, Vermilion Lake; *Kassube* 22, Minneapolis; *Herrick* 25, Minneapolis; *Sandberg* 48, Red Wing; *Hammond* 7, Lake City; *Herb. Wickersheim* 11, Mankato; *Herb. Sheld.* 1806, Minneapolis; *Herb. Moyer* 25, Montevideo.

CAPNORCHIS LUDW. Defin. Pl. 98 (1737).**Bikukulla** ADANS. Fam. Pl. (1763).**Diclytra** "BORKH." ex Bernh. and DC. Syst. (1818).**Dactylicapnos** WALLICH, Teut. Fl. Nepal, 51 (1824).**Dicentra** BERNH. Linn. VIII, 467 (1833).**Macrocapnos** ROYLE, Lindl. Intro. ed. II, 439 (1835).**Eucapnos** SIEB. and ZUCC. Abh. Ak. Mun. III, 721 (1842?).**Perizomanthus** PURSH, Fl. Am. 462 (1814).

Baillon, *Hist. Pl.* III, 143; Benth. and Hook., *Gen. Pl.* I, 55; Engler and Prantl, *Nat. Pflanz.* 3, II, 143 (Prantl and Kündig); Durand, *Ind. Gen. Phan.* 12; O. Kuntze, *Rev. Gen. Pl.* I, 15; Gray, *Ill. Gen.* I, 119.

Living species: 15; 12 (B. and H.); Central, North and East Asia and North America; E. Sts. 3; S. Sts., 2; Canada, 3; Pac. coast, 4-5.

Capnorchis cucullaria (LINN.) O. KUNTZE, *Rev. Pl. Gen.* I, 15 (1891).

Fumaria cucullaria LINN. Spec. 699 (1753).*F. pallida* SALISB. Prodr. 377 (1796).*Corydalis cucullaria* PERS. Syn. II, 269 (1807).*Cucullaria bulbosa* RAF. Med. Rep. V, 353 (1809).*Dicentra cucullaria* DC. Syst. I, 108 (1818).*Diclytra cucullaria* AUCT. VAR. After DC. Prodr.

Wats. and Coult., Gray's Man. 6 ed. 60; Upham, Fl. Minn. 23; Webb. Fl. Neb. 118; Chap., Fl. S. St. 23; Mac., Fl. Can. I, 35; Led., Fl. Ross. I, 97?; Wats., Bibl. Ind. I, 45; Engl. Prantl and Kündig, *Nat. Pflanz.* III, 2, 143; Cov., Fl. Ark. 164.

Kamtschatka?

North America: N. S., N. Br., Q., Ont. to Georgian Bay; S. to N. Eng., N. Y., N. J., N. Car.; W. to Minn., Neb. and Ark.

Minn. valley: Throughout, especially at lower levels; shady banks and damp woodland openings.

HERB.: *Taylor* 98, Glenwood; *Herrick* 26, Minneapolis; *Kassube* 23, Minneapolis; *Holzinger* 13, Winona Co.; *Sandberg* 49, Red Wing; *Herb. Sheld* 1866, Ramsey Co.; *Herb. Wickersheim* 12, Lake Benton; *Herb. Moyer* 26, Carlton Lake.

Capnorchis canadensis (GOLDIE) O. KUNTZE, *Rev. Gen. Pl.* I, 15 (1891).

Corydalis canadensis GOLDIE, Edin. Phil. Journ. VI, 330 (1822).*C. formosa* PURSH, Fl. Am. 462 (1814) *in part*.*Diclytra canadensis* DC. Prodr. I, 126 (1824).*D. eximia* BECK, Bot. 23 (1833).

Wats. and Coult., Gray's Man. 6 ed. 60; Webb., Fl. Neb. 118; Britt., Fl. N. J. 46; Upham, Fl. Minn. 23; Mac., Fl. Can. I, 35; Engl. Prantl and Kündig, *Nat. Pflanz.* III, 2, 143; Wats., Bibl. Ind. I, 45.

North America: N. S., Q. and Ont. to Man.; S. to N.

J., Ohio and Neb. Range more northward than that of *C. cucullaria*.

Minn. valley: Reported from St. Paul and Blue Earth Co.; with *C. cucullaria* (Linn.) but much less abundant.

NECKERIA SCOP. Introd. 1436 (1777).

Corydalis DC. Syst. II, 113 (1821).

Bulbocapnos BERNH. Linn. VIII, 469 (1833).

Phacocapnos BERNH. l. c. (1833).

Cryptoceras SCHOTT, ex Walp. Ann. IV, 190 (1844-48).

Sophorocapnos TURCZ. Bull. Mosq. I, 570 (1848).

Cysticapnos BOERH. ex DC. Syst. II, 112 (1821).

Ceratocapnos DUR. Parlat. Giorn. Bot. I, 336.

Capnodes MOEHR. Hort. Priv. 22 (1736).

? **Pseudofumaria** LUDW. Defn. Pl. (1737) ex Kuntze.

Baillon, *Hist. Pl.* III, 144; Benth. and Hook. *Gen. Pl.* I, 55; Engler and Prantl, *Nat. Pflanz.* 3, II, 144 (Prantl and Kündig); Durand, *Ind. Gen. Phan.* 12; O. Kuntze, *Rev. Gen. Pl.* I, 13; Gray, *Ill. Gen.* I, 123.

Living species: $90 \pm$; 70 (B. and H.); mostly in Mediterranean region and Central and N. E. Asia; a few in N. America, Cape of Good Hope region and Himalayas.; N. America, 9-10; Calif.-Oregon, 6; E. Sts., 5-6; Rocky mts., 4-5; S. Sts., 4; Canada, 5-6; Pl. Wheel., 1; Pl. King, 1; Russia, 35; Europe, 12; Russian Europe, 10; (Durand: 100 sp.).

Neckeria aurea (MICHX.) PFEIFF. Bot. Zeit. XV, 649 (1857).

Fumaria aurea MICHX. Fl. N. Am. (1803).

Corydalis aurea WILLD. Enum. 740 (1809).

C. speciosa MAXIM. Fl. Amur 39 (1859).

Wats. and Coult., Gray's Man. 6 ed. 61; Webb., Fl. Neb. 118 in var.; Coult., Fl. Colo. 14; Chap., Fl. S. St. 23; Upham, Fl. Minn. 23; Regel, Fl. O.-Sib. I, 149; Mac., Fl. Can. I, 36; Engl. Prantl and Kündig, *Nat. Pflanz.* III, 2, 144; Wats. King. Exp. 14; Cov., Fl. Ark. 165; Wats., *Bibl. Ind.* I, 44. Amurland.

North America: Q., Ont., Man., N. W. T. to lat. 64° ; S. to Vt. and Penn.; W. to Minn., Colo., Neb., Ark.; in mts. to Ft. Verde, Arizona.

Minn. valley: Throughout, particularly at higher levels and N. rather than S., although found on S. edge. Dry places.

HERB.: Sheldon 1603, Ft Snelling; Taylor 897, Glenwood; Foote 1, Worthington; Roberts 11, Duluth; Bailey 508, Agate Bay; Kassube 24, Ramsey Co.; Sandberg 51, Red Wing; Sandberg 52, Tower; Sheldon, 1631, Taylor's Falls; Herb. Wickersheim 13, Mankato; Herb. Sheld. 1865, Ft Snelling; Herb. Moyer 27, Carlton Lake.

Neckeria micrantha (ENGELM.).

Corydalis aurea var. *micrantha* ENGELM. in Gray, Man. 5. ed 62 (1867).

Corydalis micrantha (ENGELM.) WATS. and COULT. Gray's Man. 6 ed. 61 (1890).

Upham, Fl. Minn. 23; Webb., Fl. Neb. 118; Cov., Fl. Ark. 165; Wats., Bibl. Ind. I, 44; Wats., King. Exp. 14.

North America: N. Car., Neb., Mo. and Ark. to Iowa, Minn. and Uintah mts.

Minn. valley: S. edge, on higher levels; dry places and rocks.

HERB.: *Sheldon* 794, Cottonwood river, Sleepy Eye; *Foote* 2, Worthington.

Neckeria flavula (RAF.) PFEIFF. Bot. Zeit. XV. 649 (1857).

Fumaria flavula RAF. Desv. Journ. Bot. I, 224 (1808).

Corydalis flavula DC. Prodr. I, 129 (1824).

Wats. and Coult., Gray's Man. 6 ed. 60; Upham, Fl. Minn. 23; Britt., Fl. N. J. 46; Mac., Fl. Can. I, 37, 485; Cov., Fl. Ark. 165; Wats., Bibl. Ind. I, 44.

North America: Ont. to Penn., N. J., Minn. and Ark.; southward.

Minn. valley: Ft. Snelling to Blue Earth Co. and probably on higher levels along the N. side; dry banks.

HERB.: *Herrick* 28, Minneapolis.

Neckeria sempervirens (LINN.) SCOP. Intro. Hist. Nat. 313 (1777).

Fumaria sempervirens LINN. Spec. 700 (1753).

Capnodes glauca MOENCH, Meth. 52 (1794).

Corydalis sempervirens PERS. Syn. II, 269 (1807).

C. glauca PURSH, Fl. Am. 463 (1814).

Wats. and Coult., Gray's Man. 6 ed. 61; Upham, Fl. Minn. 23; Chap., Fl. S. St. 23; Mac., Fl. Can. I, 36; Engl. Prantl and Kündig, Nat. Pflanz. III, 2, 144; Regel., Fl. O.-Sib. I, 147; Wats., Bibl. Ind. I, 45; Rothr., Alask. 442.

Siberia and Kamtschatka.

North America: N. S., Q., Ont. to Brit Col., Rocky mts., Mackenzie river at lat. 64°; S. to N. Eng., N. J., N. Car.; W. to Minn. and Man.

Minn. valley: N. and N. W.; reported from Benton Co. and the Alexandria lake district. High bluffs and rocky places.

HERB.: *Roberts* 8, Put-in-bay; *Roberts* 9, Carlton's peak; *Herrick* 27, St. Louis river; *Roberts* 10, Duluth; *Bailey* 114, Vermilion lake; *Bailey* 333, St. Louis river; *Sandberg* 50, Tower.

XLV. CRUCIFERAE. Mustard Family.

Endlicher, *Gen. Pl.* 861 (1840); Benth. and Hook., *Gen. Pl.* I, 58 (1862); Prantl, *Engler and Prantl, Nat. Pflanz.* 3, II, 145 (1890); Baillon, *Hist. Pl.* III, 181 (1871).

Genera: 160—200; cosmopolitan; centers of distribution in boreal region and Mediterranean region. Fossil forms poorly understood; principally old world plants.

Species: 2000±; reduced to 1200 (B. and H.); most numerous in the Orient.

THELYPODIUM ENDL. Gen. 4915 (1336–40).

Pachypodium NUTT. Torr. and Gray, *Fl. N. Am.* I, 96 (1838).

Macropodium Hook. Bot. Beech. 74 (1841).

Baillon, *Hist. Pl.* III, 243; Benth. and Hook., *Gen. Pl.* I, 81; Engler and Prantl, *Nat. Pflanz.* 3, II, 155 (Prantl); Durand, *Ind. Gen. Phan.* 13.

Living species: 15±; mostly Calif. and Rocky mts. North America, 15; Calif., 10; W. Tex., 5; Rocky mts., 7; Pl. King, 9; Pl. Wheel., 5; E. Sts., 1; Canada, 1; S. Sts., 1.

Thelypodium pinnatifidum (MICHX.) S. WATSON, *King Exp.* 25 (1871).

Hesperis (?) *pinnatifida* MICHX. *Fl. N. Am.* II, 31 (1803).

Cheiranthus hesperioides T. and G. *Fl. N. Am.* I, 72 (1838).

Iodanthus hesperioides T. and G. *Gen.* I, 134 (1849).

Wats. and Coul., *Gray's Man.* 6 ed. 72; Upham, *Fl. Minn.* 25; Chap., *Fl. S. St.* 25; Cov., *Fl. Ark.* 165; Wats., *Bibl. Ind.* I, 73.

North America: Penn. to Ohio and Minn.; S. to Tex.

Minn. valley: Only S. E. edge of valley and rare; stony places.

HERB.: *Sandberg* 64, Red Wing.

LEPIDIDIUM LINN. Gen. 527 (1737).

Physolepidium SCHRENK. *Enum.* 97 (1841–42).

Manoploga BUNGE, *Pl. Preiss.* I, 259 (1836).

Cardaria DESVX. *Jour. Bot.* III, 163 (1810).

Lepia DESVX. *Jour. Bot.* III, 166 (1810).

Cynocardamum WEBB, *Phyt. Can.* I, 96 (1836).

Baillon, *Hist. Pl.* III, 284; Benth. and Hook., *Gen. Pl.* I, 87; Engler and Prantl, *Nat. Pflanz.* 3, II, 160 (Prantl); Durand, *Ind. Gen. Phan.* 17; O. Kuntze, *Rev. Gen. Pl.* I, 34; Gray, *Ill. Gen.* 1, 167; Schenck, *Palaeophyt.* 514.

Living species: 100±; 60–80 (B. and H.); all regions except arctic and alpine. Russia, 20; Europe, 25; European Russia, 9; North America, 17; Pl. King, 9; Pl. Wheel., 5; W. Tex., 4; Canada, 3–7; S. Sts., 1; E. Sts., 2.

Fossil species: 1, Upper Miocene, Europe (*Heer*); doubtful.

Lepidium virginicum LINN. Spec. 645 (1753).*Clypeola caroliniana* WALT. Fl. Car. 173 (1788).*Thlaspi virginianum* POIR. Enc. Meth. VII, 544 (1806).*Dileptium diffusum* and *praecox* RAF. Fl. Lud. 85 (1817).

Wats. and Coult., Gray's Man. 6 ed. 73; Chap., Fl. S. St. 30; Britt., Fl. N. J. 52; Webb., Fl. Neb. 118; Upham, Fl. Minn. 28; Mac., Fl. Can. I, 57; Gris., Fl. W. I.; Engl. Prantl, Nat. Pflanz. III, 2, 161; Cov. Fl. Ark. 166; Wats., Bibl. Ind. I, 65.

Introduced in Europe.

North America: United States throughout, except Pac. coast and N. W.; intro. in N. Eng. and Ontario.

Minn. valley: Throughout; along roadsides and railway embankments; abundant.

HERB.: *Sheldon* 61, Elysian; *Taylor* 190, Janesville; *Oestlund* 14, Hennepin Co.; *Herrick* 43, Minneapolis; *Holzinger* 25, Winona Co.; *Kassube* 33, Minneapolis; *Herb. Wickersheim* 17, Idlewild, Lincoln Co.

Lepidium intermedium GRAY, Pl. Wright, II, 15 (1852).*L. rudérale* RICH. Frankl. Journ. 16 (1823) *not* Linn.

Wats. and Coult., Gray's Man. 6 ed. 73; Coult., Fl. Colo. 26; Brew. and Wats., Fl. Calif. I, 47; Webb., Fl. Neb. 118; Upham, Fl. Minn. 28; Mac., Fl. Can. I, 57, 491; Coult., Fl. Tex. 20; Wats., King. Exp. 29; Roth., Wheel. Exp. 66; Wats., Bibl. Ind. I, 64; Greene, Fl. Fran. 275.

North America: N. S., Ont., Man., B. C. to Hudson Bay and lat. 52°; S. to N. Y., Mich., Minn., Neb., Tex. and in mts. to N. Mexico; W. to S. California and N. along Pac. coast,

Minn. valley: N. and W. portions; probably throughout; with *L. virginicum* Linn., but less abundant.

HERB.: *Sandberg* 71, Cannon Falls; *Bailey* 132, Vermilion lake; *Bailey* 524, Agate Bay; *Moyer* 245, Montevideo, Chippewa Co.

SISYMBRIUM LINN. Gen. 547 (1737).

Velarum, **Norta** and **Arabidopsis** SCHUR. Enum. Transsylv. (1866).

Pachypodium and **Descurainia** WEBB. Phyt. Can. 75 (1836).

Chamaeplium and **Sisymbrella** (*part*) SPACH, Suit. Buff. VI, 433 (1839).

Hugueninia REICH. Ic. Fl. Germ. II, 80 (1837-38).**Tonguea** ENDL. Gen. 4905 (1836-40).**Leptocarpacea** DC. Syst. Veg. II, 201 (1821).**Stenophragma** CLARK, ex Durand, *Ind. Gen.* (1888).**Drabopsis** G. KOCH, Linn. XV, 253 (1840).**Maresia** POMEL, ex Durand, l. c. (1888).**Alliaria** ADANS. Fam. Pl. II, 418 (1763).

Baillon, *Hist. Pl.* III, 239; Benth. and Hook., *Gen. Pl.* I, 77; Engler and Prantl, *Nat. Pflanz.* 3, II, 169 (Prantl); Durand, *Ind. Gen. Phan.* 14;

O. Kuntze, *Rev. Gen. Pl.* I, 30; Gray, *Ill. Gen.* I, 151.

Living species: 60+; 80 (B. and H.): 90 (Durand); temperate regions of both hemispheres; tropical (mts.) Africa. Russia, 33; Europe, 31; European Russia, 21; N. America, 11-14; Canada, 9-10; Calif., 6; E. Sts., 2; Rocky mts., 5; S. Sts., 3; Pl. King, 3; Pl. Wheel., 3; W. Tex., 2.

Sisymbrium hartwegianum FOURN. *Sisymb.* 66 (1865).

S. canescens BENTH. *Pl. Hartw.* 9 (1836).

? *S. canescens* var. *brevipes* T. and G. *Fl. I.* 92 (1838).

S. sophia GRAY, *Proc. Ac. Phil.* 57 (1863) *in part*.

? *S. brachycarpum* HOOK. and ARN. *Bot. Beech.* 323 (1841).

S. incisum var. *hartwegianum* WATS. *Bot. Calif. I.* 41 (1873).

? *S. canescens* var. *brachycarpum* UPHAM, *Fl. Minn.* 26 (1883).

S. californicum WATS. *King Exp.* 23 (1870) *part*.

Coult., *Fl. Colo.* 23; Mac., *Fl. Can. I.* 47; Wats., *Bibl. Ind. I.* 69; Webb., *Fl. Neb.* 118 (*in part*); Greene, *Fl. Fran.* 271.

North America: N. W. T. and Brit. Colo. to Calif., Colo. and Tex.; E. to Minn. and Neb.

Minn. valley: N. W. and W. districts; dry banks and sandy shores of streams.

HERB.: *Sheldon 1406*, Lake Benton; *Taylor 1044*, Glenwood.

Sisymbrium multifidum (PURSH).

Erysimum pinnatum WALT. *Fl. Car.* 174 (1788).

Cardamine (?) *multifida* PURSH, *Fl. Am.* 440 (1814).

Sisymbrium canescens NUTT. *Gen. II.* 68 (1818).

Cardamine menziesii DC. *Syst. II.* 267 (1821).

Sisymbrium pinnatum GREENE, *Bull. Calif. Acad. II* (1887).

Wats. and Coult., *Gray's Man.* 6 ed. 72; Coult., *Fl. Colo.* 23; Brew. and Wats., *Fl. Calif. I.* 40; Upham, *Fl. Minn.* 26; Webb., *Fl. Neb.* 118; Britt., *Fl. N. J.* 51; Mac., *Fl. Can. I.* 46; Wats., *King Exp.* 23; Roth., *Wheel. Exp.* 64, 355; Cov., *Fl. Ark.* 166; Wats., *Bibl. Ind. I.* 68; Greene, *Fl. Fran.* 271.

North America: Arctic circle, throughout Canada; S. in mts. to Mexico; W. to Calif.; E. to Penn., N. Y. and N. J.

Minn. valley: Throughout, in waste places and along roadsides or on sandy banks.

HERB.: *Ballard 136*, Chaska; *Sheldon 1406*, Lake Benton; *Sheldon 307*, Madison Lake; *Taylor 1044*, Glenwood; *Holzing 24*, Winona Co.; *Herrick 41*, Minneapolis; *Kassube 31*, Minneapolis; *Sandberg 67*, Red Wing; *Huntington 2*, Rock Co.; *Herb. Sheld. 1843*, Ft. Snelling; *Herb. Moyer 31*, Montevideo.

BARBAREA R. BR. *Hort. Kew. IV.* 109 (1812).

Baillon, *Hist. Pl.* III, 232; Benth. and Hook., *Gen. Pl.* I, 68; Engler and Prantl, *Nat. Pflanz.* 3, II, 183 (Prantl); Durand, *Ind. Gen. Phan.* 12; Gray, *Ill. Gen.* I, 147.

Living species: 14; 25 enum. 6 reduc. (B. and H.); temperate and boreal region of N. hemisphere; also Australia. Europe, 9-10; Russia, 6; North America, 1-2.

Barbarea barbarea (LINN.) var. **stricta** (Andrz.).

Barbarea stricta ANDRZ. Bess. Pl. Volhyn. 72 (1822).

Barbarea vulgaris R. BR. var. *stricta* REGEL, Fl. O.-Sib. I, 155 (1862).

B. praecox RICH. Frankl. Journ. 15 (1823).

Wats. and Coult., Gray's Man. 6 ed. 70; Coult., Fl. Colo. 23 *in part*; Upham, Fl. Minn. 25; Wats., King Exp. 50; Brew. and Wats., Fl. Calif. I, 40 *in part*; Regel, Fl. O.-Sib. I, 155; Mac., Fl. Can. I, 44; Forbes and Hemsl., Fl. Sin. I, 41 *spec.*; Led., Fl. Ross. I, 115; Nym., Fl. Eur.; Miyabe, Fl. Kur. 217; Herd., Fl. Eur. Russ. 14; Hook., Fl. Gt. Brit. 26; Wats., Bibl. Ind. I, 50; Hart., Fl. Scand. I, 192; Rothr., Alask. 442.

Europe: Scandinavia to Italy and mid. Russ.; Siberia; Kamtschatka; China? The species is nearly cosmopolitan, being found in N. hemisphere throughout and in Africa and Australia. It is by no means certain that *B. stricta* Andrz. is not a good species.

North America: L. Superior to Oregon and Brit. Col.; S. in mts. to Colo. and N. in Man. Eastern forms are probably introduced and adventive from Europe.

Minn. valley: Only in N. E. corner and rare; wet grounds and roadsides.

HERB.: *Roberts 13*, Two Harbors; *Holzinger 20*, Winona Co.; *Lackor 1*, Hennepin Co.

NASTURTIUM R. BR. Hort. Kew. IV, 109 (1812).

Leiolobium REICH. Consp. 184 (1828).

Roripa BESS. (part) ex Gren. and Godr. Fl. Fr. I, 125 (1848).

Nasturtiopsis BOISS. Fl. Or. I, 237 (1842).

Brachylobus SCHUR. Enum. Transsylv. 39 (1866).

Clandestinaria SPACH, Suit. Buff. VI, 478 (1839).

Baillon, *Hist. Pl.* III, 232; Benth. and Hook., *Gen. Pl.* I, 68; Engler and Prantl, *Nat. Pflanz.* 3, II, 184 (Prantl); Durand, *Ind. Gen. Phan.* 12; O. Kuntze, *Rev. Gen. Pl.* I, 21; Gray, *Ill. Gen.* I, 131.

Living species: 50+; 20 (B. and H.); 25 (Durand); cosmopolitan. Russia, 18; Russian Europe, 11; Europe, 17; North America, 13; W. Tex., 5; Canada, 8-9; E. Sts., 5; Rocky mts., 5; S. Sts., 8; Calif., 5; Pl. King., 5; Pl. Wheel., 5-6.

Nasturtium hispidum (DESV.) DC. Syst. II, 201 (1821).

Brachylobus hispidus DESV. Journ. Bot. II, 183 (1809).

Sisymbrium hispidum POIR. Suppl. XIII, 161 (1817).

Nasturtium palustre var. *hispidum* F. and M. Ind. Sem. Petr. III, 41 (1838).

Wats. and Coult., Gray's Man. 6 ed. 70; Coult., Fl. Colo. 24; Brew. and Wats., Fl. Calif., I, 42; Webb., Fl. Neb. 119; Upham, Fl. Minn. 24; Regel,

Fl. O.-Sib. I, 151 *in part?*; Mac., Fl. Can. I, 38, 485; Led., Fl. Ross. I, 113 *in part?*; Wats., King Exp. 16; Roth., Wheel. Exp. 61; Wats., Bibl. Ind. I, 66.

Transbaikal Siberia?

North America: N. W. T. and Sierras to the Atl. and Gulf of Mexico.

Minn. valley: Principally S. W. and W.; with *N. palustre* (Leys.).

HERB.: *Sheldon 1512*, Lake Benton; *Taylor 652*, Minnesota lake.

Nasturtium palustre (LEYS.) DC. Syst. II, 191 (1821).

Sisymbrium palustre LEYS. Fl. Hal. (1761).

Radicula palustris MOENCH, Meth. 263 (1794).

Camelina barbareaefolia DC. Syst. II, 517 (1821).

Roripa nasturtioides SPACH, Phan. VI, 506 (1838).

Wats. and Coult., Gray's Man. 6 ed. 70; Coult., Fl. Colo. 24; Webb., Fl. Neb. 119; Wats., King Exp. 15, 16; Upham, Fl. Minn. 24; Brew. and Wats., Fl. Calif. I, 42; Chap., Fl. S. St. 25; Mac., Fl. Can. I, 37, 485; II, 300; Forbes and Hems., Fl. Sin. I, 41; Led., Fl. Ross. I, 112; Wats., Bibl. Ind. I, 66; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 14; Engl. Prantl, Nat. Pflanz. III, 2, 184; Coult., Fl. Tex. 17; Roth., Wheel. Exp. 61; Hart., Fl. Scand. I, 193; Rothr., Alask. 442; Greene, Fl. Fran. 268.

Europe; N. Africa; N. and temp. Asia.

North America: Greenland and N. S. to Alaska, N. W. T. and B. C.; S. to gulf and in Mexico; E. to N. Eng., N. J. and N. Car.

Minn. valley: Throughout; wet places and marshy meadows.

HERB.: *Sheldon 1398*, Lake Benton; *Ballard 326*, Belle Plaine; *Ballard 266*, Jordan, Scott Co.; *Ballard 671*, Waconia; *Taylor 862*, Glenwood; *Sheldon 1093*, Springfield; *Sheldon 760*, Sleepy Eye; *Taylor 230*, Janesville; *Taylor 341*, Janesville; *Taylor 164a*, Janesville; *Oestlund 12*, Minneapolis; *Herrick 29*, Minneapolis; *Kassube 25*, Minneapolis; *Herrick 30*, St. Louis river; *Holzinger 14*, Winona Co.; *Sandberg 53*, Cannon Falls; *Herb. Moyer 246*, Montevideo.

Nasturtium sinuatum NUTT. T. and G. Fl. I, 73, 666 (1838).

Wats. and Coult., Gray's Man. 6 ed. 70; Coult., Fl. Colo. 24; Wats., Bibl. Ind. I, 67; Roth., Wheel. Exp. 61; Brew. and Wats., Fl. Calif. I, 43; Cov., Fl. Ark. 165; Wats., King Exp. 15; Webb., Appx. Neb. 31; Greene, Fl. Fran. 267.

North America: Sierra Nevada mts. to Mexico; E. to Mississippi valley; N. to Minn. and Dak.

Minn. valley: Lower levels, especially E. and N. E.; Ft. Snelling to New Ulm.

HERB: *Ballard 37*, Chaska; *Ballard 653*, Chaska.

CARDAMINE LINN. Gen. 541 (1737).**Dentaria** LINN. Gen. 540 (1737),**Pteroneuron** DC. Prodr. I, 154 (1824).**Kardanoglyphos** SCHLECHT. Linn. XXVIII, 472 (1853).

Baillon, *Hist. Pl.* III, 234; Benth. and Hook., *Gen. Pl.* I, 70; Engler and Prantl, *Nat. Pflanz.* 3, II, 184 (Prantl); Durand, *Ind. Gen. Phan.* 13; O. Kuntze, *Rev. Gen. Pl.* I, 21; Gray, *Ill. Gen.* I, 135, 137.

Living species: 65; boreal regions and to tropics in N. hemisphere; also Peru, Argentine, Brazil (a few species). N. America, 20; E. Sts., 8; Canada, 12-13; S. Sts., 10; Pac. coast, 10-12.

Cardamine parviflora LINN. Spec. ed. 2, 914 (1762).*C. sylvatica* LINK. DC. Syst. II, 260 (1821).*C. hirsuta* var. *sylvatica* GRAY, Man. 5 ed. 67 (1868).*C. flexuosa* BRITT. Trans. N. Y. Acad. IX, 8 (1889) *not With.*

Wats. and Coult., Gray's Man. 6 ed. 65; Upham, Fl. Minn. 24; Britt., Fl. N. J. 49; Mac., Fl. Can. I, 41, 486; II, 302; Nym., Fl. Eur.; Led., Fl. Ross. I, 127; Regel, Fl. O.-Sib. I, 171; Herd., Fl. Eur. Russ. 14; Hook., Fl. Gt. Brit. 29; Wats., Bibl. Ind. I, 53.

Northern England to Shetland; N. Asia; Eur. exc. far N. E. and Greece, Turkey and Italy.

North America: Range as that of *C. hirsuta* Linn.

Minn. valley: N. E. in valley and extending probably to Blue Earth Co.; drier places and banks of streams; rare.

HERB.: *Herrick 35*, L. Minnetonka, S. shore.

Cardamine hirsuta LINN. Spec. 655 (1753).*Cardamine pennsylvanica* MUHL. Willd. Spec. III, 486 (1800).? *Sisymbrium nasturtium* WALT. Fl. Car. 174 (1788).

Wats. and Coult., Gray's Man. 6 ed. 65; Coult., Fl. Colo. 19; Chap., Fl. S. St. 26; Britt., Fl. N. J. 49; Upham, Fl. Minn. 24; Mac., Fl. Can. I, 41; Forbes and Hems., Fl. Sin. 43; Led., Fl. Ross. I, 127; Nym., Fl. Eur.; Gris., Fl. W. I.; Herd., Fl. Russ. Eur. 10; Engl. Prantl, *Nat. Pflanz.* III, 2, 185; Cov., Fl. Ark. 166; Hook., Fl. Gt. Brit. 28; Wats., Bibl. Ind. I, 53; Hart., Fl. Scand. I, 189; Rothr., Alask. 443.

Shetland; Scotland; England; N. Russ. to Caucasus; N. Asia and China.

North America: N. S. to Arctic ocean and Pac. and Alaska; S. to N. Eng., N. J. and Fla. to Dak., Colo. and Mont.; Jamaica.

Minn. valley: Forest region from Ft. Snelling to Blue Earth Co.; E. and N.; marshy meadows; not common.

HERB.: *Sheldon 1476*, Pipestone; *Taylor 1000a*, Janesville; *Sheldon 812*, Sigel township, Brown Co.; *Taylor 279*, Janesville; *Sheldon 294*, Madison Lake; *Ballard 113*, Carver, *Roberts 12*, Agate bay; *Herrick 33*, Minneapolis; *Herrick 34*, St Louis river; *Holzinger 16*, Winona Co.; *Kassube 27*, Mendota.

Bailey 405, Burntside lake; *Holzinger* 17, Winona Co.; *Sandberg* 57, Red Wing; *Leiberg* 8, Blue Earth Co.; *Herb. Moyer* 247, Montevideo.

These plants are under the *C. pennsylvanica* of Muhl., which differs somewhat from European *C. hirsuta* Linn.

***Cardamine bulbosa* (SCHREB.) B.S.P. Cat. Pl. N. Y. (1888).**

Arabis bulbosa SCHREB. Icon. (1766).

A. rhomboidea PERS. Syn. II, 204 (1807).

Thlaspi tuberosum NUTT. Gen. II, 65 (1818).

Cardamine rhomboidea DC. Syst. II, 246 (1821).

Wats. and Coult., Gray's Man. 6 ed. 65; Britt., Fl. N. J. 49; Chap., Fl. S. St. 25; Mac., Fl. Can. I, 40; Upham, Fl. Minn. 24; Cov., Fl. Ark. 165; Wats., Bibl. Ind. I, 54.

North America: N. S., Ont., N. Eng. to Fla.; W. to Minn. and Dak.

Minn. valley: Throughout, but more abundant in forest region; springs; near streams and in marshy meadows.

HERB.: *Menzel* 2, Pipestone; *Ballard* 29, Chaska; *Kassube* 26, Minneapolis; *Herrick* 31, Minneapolis; *Herrick* 32, Minneapolis; *Sandberg* 56, Cannon Falls; *Herb. Sheld.* 1845, Minneapolis; 1725, Ramsey Co.; *Herb. Moyer* 28, Montevideo.

***Cardamine laciniata* (MUHL.) WOOD, Bot. and Fl. 38 (1861).**

Dentaria laciniata MUHL. Willd. Spec. III, 479 (1800).

D. concatenata MICHX. Fl. N. Am. II, 30 (1803).

Wats. and Coult., Gray's Man. 6 ed. 64; Chap., Fl. S. St. 26; Upham, Fl. Minn. 24; Britt., Fl. N. J. 49; Mac., Fl. Can. I, 39; Cov., Fl. Ark. 166; Wats., Bibl. Ind. I, 56; Webb., Appx. Neb. 31.

North America: Q., Ont., N. Eng., N. J. to Fla.; W. to Minn., Dak., Neb., Kan. and Ark.

Minn. valley: Eastern half; Ft. Snelling to Blue Earth Co.; especially forest region; banks of lakes and streams.

HERB.: *Sheldon* 138, Madison Lake; *Sheldon* 173, Eagle Lake, Blue Earth Co.; *Powell* 1, St. Paul; *Leiberg* 7, Blue Earth Co.; *Holzinger* 15, Winona Co.; *Sandberg* 54, Red Wing; *Sandberg* 55, Minneapolis; *Herb. Wickersheim* 14, Mankato.

***Cardamine diphylla* (MICHX.) WOOD, Bot. and Fl. 37 (1861).**

Dentaria diphylla MICHX. Fl. N. Am. II, 30 (1803).

Wats. and Coult., Gray's Man. 6 ed. 64; Britt., Fl. N. J. 49; Chap., Fl. S. St. 26; Upham, Fl. Minn. 24; Mac., Fl. Can. I, 39; Wats., Bibl. Ind. I, 56.

North America: N. S., N. Br., Q., Ont. to L. Superior region; S. to Maine, N. J., Kentucky and Minn.

Minn. valley: Ft. Snelling to Blue Earth Co.; rich woodland and banks of streams; rare or local.

LESQUERELLA S. WATS. Proc. Am. Acad. XV, 249 (1888).

Physaria NUTT. T. and G. Fl. I, 101 (1838) *not Pers.*

Coulterina O. KUNTZE, Rev. Gen. II Nachtr., 931 (1891).

Vesicaria AUCT. AM.

Baillon, *Hist. Pl.* III, 273; Benth. and Hook., *Gen. Pl.* I, 73; Engler and Prantl, *Nat. Pflanz.* 3, II, 187; Durand, *Ind. Gen. Phan.* 13.

Living species: 33; Mexico; W. N. America to Greenland and Brazil; especially developed in plateaus of the S. W. W. Tex., 12; E. Sts., 3; Canada, 5; S. Sts. 1.

Lesquerella argentea (PURSH).

Myagrum argenteum PURSH, Fl. Am. 434 (1814).

Vesicaria globosa DESVX. Journ. Bot. III, 181 (1814).

Alyssum ludovicianum NUTT. Gen. II, 63 (1818).

Vesicaria ludoviciana DC. Syst. II, 297 (1821).

Physaria argentea MACM. MSS. (1890).

Lesquerella ludoviciana S. WATS. Gray's Man. 6 ed. 69 (1890).

Coult., Fl. Colo. 25; Webb., Fl. Neb. 119; Upham, Fl. Minn. 27; Mac., Fl. Can. I, 54, 490; II, 305; Wats., Bibl. Ind. I, 75.

North America: Minn., Neb., Colo., Wyoming; S. to Arizona?; N. to N. W. T.

Minn. valley: S. W. and N. W. portions; rocky banks and high bluffs; rare.

'HERB.: Sandberg 70, Red Wing.

DRABA LINN. Gen. 535 (1737).

Erophila DC. Syst. II, 356 (1821).

Petrocallis R. BR. Hort. Kew. IV, 93 (1812).

Dollineria SAUT. Flora, 353 (1852).

Holargidium TURCZ. Led., Fl. Ross. I, 156 (1842).

Coleonema MAXIM. ex Durand (1888).

Heterodraba GREENE, ex Prantl (1890).

Baillon, *Hist. Pl.* III, 271; Benth. and Hook., *Gen. Pl.* I, 74; Engler and Prantl, *Nat. Pflanz.* 3, II, 190 (Prantl); Durand, *Ind. Gen. Phan.* 14; Gray, *Ill. Gen.* I, 159.

Living species: 150+; 70-80 (B. and H.); mountain districts in almost all regions; arctic, antarctic and sub arctic regions; principally in Northern hemisphere. Russia, 47; Russian Europe, 19; Europe, 35; North America, 24; Canada, 18; Rocky mts, 12; Calif., 9; E. Sts., 6; S. Sts., 5; Pl. King, 7-8; Pl. Wheel., 7; W. Tex., 2.

Draba nemorosa LINN. Spec. 643 (1753).

D. nemoralis EHRH. Beitr. VII, 154 (1792).

D. nemorosa vars. *lejocarpa* and *hebecarpa* LED. Fl. Ross. I, 154 (1842).

Wats. and Coult., Gray's Man., 6 ed. 68; Coult., Fl. Colo. 17; Brew. and Wats., Fl. Calif. I, 28?; Upham, Fl. Minn. 27; Trautv., Fl. Sib. 23; Regel, Fl. O.-Sib. I, 198; Mac., Fl. Can. I, 52; Forbes and Hems., Fl. Sin. I, 41;

Led., Fl. Ross., 1. c.; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 18; Engl. Prantl, Nat. Pflanz. III, 2, 190; Wats., King Exp. 22; Wats., Bibl. Ind. I, 60; Hart., Fl. Scand. I, 205; Rothr., Alask. 443.

Europe: Sweden to Pyrenees, Hungary, Mid. Russ. and Caucasus; Siberia, Amurland, China, Baikal mts. and Kamtschatka.

North America: All western Can. to lat. 66° N.; E. to L. Superior and Montreal; S. through Yellowstone river region to Colo.; E. to Minn. and Mich.

Minn. valley: The plants of this region do not seem to be different from the typical *D. nemorosa* Linn. N. edge of valley especially in Leaf Hill district; dry hillsides.

HERB.: *Gedge* 2, Glyndon; *Herb. Moyer* 248, Montevideo.

***Draba caroliniana* WALT.** Fl. Car. 174 (1788).

? *Arabis reptans* LAM. Enc. Meth. I, 222 (1783).

Draba hispidula MICHX. Fl. N. Am. II, 28 (1803).

D. umbellata MUHL. Cat. 62 (1813).

Arabis rotundifolia RAF. Am. Mo. Mag. II, 23 (1830).

Wats. and Coult., Gray's Man. 6 ed. 68; Webb., Fl. Neb. 119; Britt., Fl. N. J. 50; Chap., Fl. S. St. 29; Upham, Fl. Minn. 27; Mac., Fl. Can. I, 52; Wats., King Exp. 23; Cov., Fl. Ark. 166; Wats., Bibl. Ind. I, 59.

North America: E. Mass. and N. J. to Ga.; W. to Minn. and Neb.; S. Ontario.

Minn. valley: Throughout except far N. W.; at higher levels; sandy and dry hillsides or banks.

HERB.: *Kassube* 32, Minneapolis; *Herrick* 42, Minneapolis; *Sandberg* 68, Red Wing; *Simmons* 1, Minneapolis; *Sandberg* 69, Cannon Falls; *Herb. Moyer* 32, Montevideo.

***Draba micrantha* NUTT.** T. and G. Fl. I, 109 (1838).

D. caroliniana var. *micrantha* GRAY, Man. 5 ed. 72 (1867).

Wats. and Coult., Gray's Man. 6 ed. 68; Webb., Fl. Neb. 119; Upham, Fl. Minn. 27; Coult., Fl. Tex. 18; Cov., Fl. Ark. 166; Wats., Bibl. Ind. I, 59.

North America: Minn., Ill., Iowa, Neb., Kan., Mo., Ark., Tex.

Minn. valley: S. edge and infrequent; dry hillsides.

***Draba verna* LINN.** Spec. 642 (1753).

D. verna var. *americana* PERS. Syn. II, 190 (1807).

Erophila americana and *vulgaris* DC. Syst. II, 356 (1821).

Erophila vulgaris var. *americana* DARL. Fl. Cestr. 378 (1837).

Wats. and Coult., Gray's Man. 6 ed. 68; Upham, Fl. Minn. 27; Mac., Fl. Can. I, 53; Led., Fl. Ross. I, 155; Herd., Fl. Russ. Eur. 10; Engl. Nat. Pflanz. III, 2, 190; Wats., Bibl. Ind. 62; Chap., Fl. S. St. 29; Hart., Fl. Scand. I, 205.

Europe: Mediterranean region and Russia.

North America: Q., Ont., N. Eng. and Atl. coast to Fla.; W. to Minn. and Mo. The absence of this species N. W. in Brit. Amer. is perhaps evidence that it is introduced and not endemic. It is included here owing to a doubt whether this argument is conclusive.

Minn. valley: Ft. Snelling; roadsides and waste places; only N. E.

ARABIS LINN. Gen. 544 (1737).

Turritis LINN. Gen. 819 (1737).

Stevenia AD. and FISCH. Led. Fl. Ross. I, 123 (1840).

Arabidium SPACH, Suit. Buff. VI, 436 (1839).

Baillon, *Hist. Pl.* III, 233; Benth. and Hook., *Gen. Pl.* I, 69; Engler and Prantl, *Nat. Pflanz.* 3, II, 192 (Prantl); Durand, *Ind. Gen. Phan.* 13; Gray, *Ill. Gen.* 141, 143; O. Kuntze, *Rev. Gen. Pl.* I, 27.

Living species: 145 described; $105 \pm$ distinct; 65 (B. and H.); 79 (Durand); principally in Europe and Asia; boreal to Mediterranean provinces; also North America and a few in South America, the Orient and Australia. Russia, 30; Europe, 35; Russian Europe, 13; North America, 21; Canada, 19-20; Calif., 10; E. Sts., 9; Rocky mts., 8; S. Sts., 6; W. Tex., 2; Pl. King, 9; Pl. Wheel., 3.

Arabis dentata TORR. T. and G., Fl. I, 80 (1838).

Sisymbrium dentatum TORR. Short and Peter Pl. Kent. 3d Suppl. 338 (1834).

Shortia dentata RAF. Autik. Bot. 17 (1836).

Wats. and Coult., Gray's Man. 6 ed. 67; Upham, Fl. Minn. 24; Chap., Fl. S. St. 27; Wats., Bibl. Ind. I, 47; Webb., Appx. Neb. 31.

North America: N. Y. to Tenn.; W. to Mich., Minn. and Neb.

Minn. valley: Ft. Snelling to Blue Earth Co.; woods and shaded banks; rare.

HERB.: *Sandberg* 59, Red Wing; *Mayland* 1, Minneapolis.

Arabis lyrata LINN. Spec. 665 (1753).

Sisymbrium arabidoides HOOK. Fl. Bor.-Am. I, 63 (1833).

S. humifusum J. VAHL, Fl. Dan. XIII, 2297 (1840).

Wats. and Coult., Gray's Man. 6 ed. 67; Britt., Fl. N. J. 48; Chap., Fl. S. St. 27; Upham, Fl. Minn. 24; Coult., Fl. Colo. 20; Mac., Fl. Can. I, 41; Miyabe, Fl. Kur. 217; Wats., Bibl. Ind. I, 49.

Middle and N. Japan to Kurile Islands.

North America: E. Can. to B. C. and lat. 68° N.; S. to N. Eng., N. J. and N. Car.; W. to Mont., Colo., Minn. and Neb.

Minn. valley: Only in region of Ft. Snelling and N. E. edge; rocky banks and dry places.

HERB.: *Sandberg* 58, Red Wing; *Holzinger* 18, Winona Co.; *Holzinger* 19, Winona Co.

***Arabis confinis* S. WATSON.** Proc. Am. Acad. XXII, 466 (1887).

A. drummondii GRAY, Proc. Am. Acad. VI, 187 (1863).

Wats. and Coult., Gray's Man. 6 ed. 67; Upham, Fl. Minn. 25; Webb., Fl. Neb. 119; Coult., Fl. Colo. 20; Mac., Fl. Can. I, 43; II, 303; Roth., Wheel. Exp. 62; Wats., King Exp. 17, 18; Cov., Fl. Ark. 165; Wats., Bibl. Ind. I, 47.

North America: N. Br., Q., Ont. to Pac., lat. 52°; S. in Rockies to S. Colo.; E. to St. Lawrence river, Conn., Ill. and N. Y.

Minn. valley: N. and E. portions; forest district; dry and stony banks and fields.

HERB.: *Herrick* 39, Minneapolis; *Sandberg* 63, Cannon Falls; *Kassube* 29, Minneapolis; *Herb. Sheld.* 1846, Minneapolis; *Herb. Wickersheim* 15, Mankato.

***Arabis glabra* (LINN.) WEINM.** Cat. Dorp. 18 (1810).

Turritis glabra LINN. Spec. 636 (1753).

Arabis perfoliata LAM. Enc. Meth. I, 219 (1783).

Turritis macrocarpa NUTT. T. and G. Fl. I, 78 (1838).

Wats. and Coult., Gray's Man. 6 ed. 66; Britt., Fl. N. J. 49; Upham, Fl. Minn. 25; Coult., Fl. Colo. 19; Hook., Fl. Gt. Brit. 27; Mac., Fl. Can. I, 43; Led., Fl. Ross. I. 116; Regel, Fl. O.-Sib. I, 160; Wats., King Exp. 17; Roth., Wheel. Exp. 61; Cov., Fl. Ark. 165; Wats., Bibl. Ind. I, 49; Webb., Appx. Neb. 31; Greene, Fl. Fran. 253.

Arctic Europe; temp. Asia to Himalayas.

North America: Ont., Hudson Bay to Slave lake, Rockies lat. 64° N. and Brit. Col.; S. in West to San Diego, Cal.; E. to N. Eng. and N. J.

Minn. valley: Forest district to Blue Earth Co.; rare or infrequent; N. and N. E.; rocky and dry places.

HERB.: *Juni* 1, Poplar river.

***Arabis canadensis* LINN.** Spec. 655 (1753).

Arabis falcata MICHX. Fl. N. Am. I. 31 (1803).

A. mollis RAF. Am. Mo. Mag. (1810?).

Turritis lyrata RAF. Am. Mo. Mag. (1810?).

Arabis lyræifolia DC. Syst. II, 244 (1821).

Wats. and Coult., Gray's Man. 6 ed. 66; Britt., Fl. N. J. 48; Webb., Fl. Neb. 119; Chap., Fl. S. St. 28; Upham, Fl. Minn. 25; Mac., Fl. Can. I, 44; Cov., Fl. Ark. 165; Wats., Bibl. Ind. I, 47.

North America: Ont., N. Y. and N. Eng.; S. to N. J., Va. and Tenn.; W. to Neb., Minn., Dak., Mo. and Ark.

Minn. valley: Throughout at lower levels and perhaps far westward; wooded valleys and edges of thickets.

HERB.: *Sheldon* 937, Redwood Falls; *Ballard* 196, Jordan, Scott Co.; *Sheldon* 611, Wilton, Waseca Co.; *Sandberg* 62, Cannon Falls; *Oestlund* 13, Hennepin Co.

***Arabis laevigata* (MUHL.) POIR.** Suppl. I, 411 (1810).

Turritis laevigata MUHL. Willd. Spec. III, 543 (1802).

? *Arabis pendula* NUTT. Gen. II, 70 (1818).

A. heterophylla NUTT. T. and G. Fl. I, 81 (1838).

Wats. and Coult., Gray's Man. 6 ed. 66; Chap., Fl. S. St. 28; Britt., Fl. N. J. 48; Upham, Fl. Minn. 25; Mac., Fl. Can. I, 44; Cov., Fl. Ark. 165; Wats., Bibl. Ind. I, 49.

North America: Q., Ont., N. Eng., N. J. to Minn.; S. to Tenn. and N. Car.

Minn. valley: E. and N. region; forest district; local or infrequent.

HERB.: *Taylor* 141, Janesville; *Sheldon* 56 $\frac{1}{2}$, Elysian; *Sandberg* 61, Taylor's Falls.

***Arabis hirsuta* (LINN.) SCOP.** Fl. Carn. ed. II, 835 (1772).

Turritis hirsuta LINN. Spec. (1753).

Turritis hirsuta MUHL. Cat. 61 (1813).

T. ovata PURSH. Fl. Am. 21, 38 (1814).

T. oblongata RAF. Am. Mo. Mag. II, 44 (1810).

Wats. and Coult., Gray's Man. 6 ed. 66; Britt., Fl. N. J. 48; Webb., Fl. Neb. 119; Chap., Fl. S. St. 27; Upham, Fl. Minn. 24; Hook., Fl. Gt. Brit. 27; Trautv., Fl. Sib. 16; Brew. and Wats., Fl. Calif. I, 32; Regel, Fl. O.-Sib. I, 160; Mac., Fl. Can. I, 42; Forbes and Hems., Fl. Sin. I, 42; Led., Fl. Ross. I, 118; Herd., Fl. Russ. Eur. 14; Engl. Prantl, Nat. Pflanz. III, 2, 193; Wats., King Exp. 16 in part; Roth., Wheel. Exp. 62?; Cov., Fl. Ark. 165; Wats., Bibl. Ind. I, 48; Hart., Fl. Scand. I, 190; Rothr., Alask. 442.

Europe: Scandinavia to Italy, Servia and Mid. Russ.; N. Asia to Caucasus, Baikal mts. and Kamtschatka.

North America: N. Br. to Brit. Col., Pac. and Alaska; S. to N. Eng., N. J. and Tenn.; W. to Neb., Minn., Colo. and Ark.; Black Hills.

Minn. valley: Throughout; dry banks and rocky places; frequent.

HERB.: *Sheldon* 799, Sleepy Eye; *Taylor* 42, Elysian; *Sheldon* 9, Waterville; *Ballard* 378, Jordan, Scott Co.; *Taylor* 647, Minnesota lake; *Kassube* 28, Minneapolis; *Herrick* 36, Minneapolis; *Sandberg* 60, Cannon Falls; *Herrick* 37, Minneapolis; *Leiberg* 9, Blue Earth Co.; *Herb. Sheldon* 1911, Minneapolis; *Herb. Moyer* 29, Montevideo.

***Arabis patens* SULLIV.** Am. Journ. Sci. I, 42, 49 (1842).

Wats. and Coult., Gray's Man. 6 ed. 66; Upham, Suppl. Fl. Minn. 46; Chap., Fl. S. St. 27; Wats., Bibl. Ind. I, 49.

Penn. to Ohio and Tenn.; local in Minn.

Minn. valley: Nicollet Co. Glen five miles above Mankato. Reported as local.

ERYSIMUM LINN. Gen. 545 (1737).

Braya S. and H. DC. Syst. II, 210 (1821).

Platypetalum R. BR. Appx. Parr. Voy. 266 (1823).

Strophades BOISS. Ann. Sci. Nat. Ser. 2. XVII, 73 (1842).

Baillon, *Hist. Pl.* III, 240; Benth. and Hook., *Gen. Pl.* I, 79; Engler and Prantl, *Nat. Pflanz.* 3, II, 193 (Prantl); Durand, *Ind. Phan. Gen.* 15; Gray, *Ill. Gen.* I, 149; O. Kuntze, *Rev. Gen.* I, 27.

Living species: 125 described; 80 clearly defined; Southern Europe, Mediterranean region and the Orient; also Central Asia and North America; Himalayas and Mexico; Russia, 30; Europe, 30; Russian Europe, 19; North America, 4-5; E. Sts., 3; Calif. 1; Rocky mts., 4; W. Tex., 1; S. Sts., 1; Canada, 3; Pl. King, 2; Pl. Wheel., 5.

Erysimum inconspicuum (S. WATS.).

Erysimum parviflorum NUTT. T. and G. Fl. I, 95 (1838), *not Pers.*

E. lanceolatum HOOK. Fl. Bor.-Am. I, 64 (1833) *not R. Br.*

E. asperum var. *inconspicuum* S. WATSON, King. Exp. 24 (1871).

Wats. and Coult., Gray's Man. 6 ed. 71; Coult., Fl. Colo. 22; Brew. and Wats. Fl. Calif. I, 39; Upham, Fl. Minn. 25; Mac., Fl. Can. I, 45, 487; Wats., Bibl. Ind. I. 63.

North America: Saskatchewan to Brit. Col. and N. W. T.; Alaska 62° 45' N.; E. to Man. and Minn.; S. to Kan.

Minn. valley: Sparingly, throughout; along railway tracks and sandy banks.

HERB.: *Sheldon* 361, Madison Lake; *Upham* 1, Minneapolis; *Holzinger* 23, Winona; *Sandberg* 66, Red Wing.

Erysimum asperum (NUTT.) DC. Syst. II, 505 (1821).

Cheiranthus asper NUTT. Gen. II, 69 (1818).

Erysimum lanceolatum PURSH, Fl. Am 436 (1814) *not R. Br.*

? *E. grandiflorum* NUTT. ex Greene, Fl. Fran. 269 (1891).

Wats. and Coult., Gray's Man. ed. 6, 71; Coult., Fl. Colo. 22; Brew. and Wats., Fl. Calif. 39; Webb., Fl. Neb. 118 in var.; Upham, Fl. Minn. 25; Mac., Fl. Can. I, 45; Coult., Fl. Tex. 16; Wats., King Exp. 24; Roth., Wheel. Exp. 64; Cov., Fl. Ark. 166; Wats., Bibl. Ind. I, 62; Webb., Appx. Neb. 30.

North America: Saskatchewan and prairie-region of Can. to Calif., Colo., Arizona and Mexico; E. to Tex., Ohio and Minn.

Minn. valley: W. and S. W. portions, only; dry sandy prairie at higher levels.

HERB.: *Sheldon* 1407, Lake Benton.

Erysimum cheiranthoides LINN. Spec. 661 (1753).*E. parviflorum* PERS. Syn. II, 199 (1807).

Wats. and Coult., Gray's Man. 6 ed. 71; Britt., Fl. N. J. 51; Webb., Fl. Neb. 118; Coult., Fl. Colo., 22; Hook., Fl. Gt. Brit. 31; Upham, Fl. Minn. 25; Trautv., Fl. Sib. 27; Regel, Fl. O.-Sib. I, 206; Mac., Fl. Can. I, 45, 487; Nym., Fl. Eur.; Led., Fl. Ross. I, 189; Herd., Fl. Russ. Eur. 16; Engl. Prantl, Nat. Pflanz. III, 2, 193; Roth., Wheel. Exp. 64; Wats., King Exp. 24; Wats., Bibl. Ind. I, 63; Forbes and Hems., Fl. Sin. I, 46; Cov., Fl. Ark. 166; Hart., Fl. Scand. I, 186.

N. Europe; N. Asia; N. Africa.

North America: Can. throughout, east of Rocky mts.; N. to lat. 67° on the Mackenzie river and in Alaska; S. in mts. to Colo.; E. to Minn., Neb., Ark., Penn., N. J. and Mass.

Minn. valley: Throughout; marshy meadows; wooded banks of lakes and streams; edges of thickets.

HERB.: *Ballard* 110, Shakopee; *Taylor* 857, Glenwood; *Taylor* 902, Glenwood; *Taylor* 1006, Glenwood; *Ballard* 284, Jordan, Scott Co.; *Taylor* 412, Buffalo lake, Waseca Co.; *Sheldon* 1092, Springfield; *Sheldon* 559, Waseca; *Sheldon* 1408, Lake Benton; *Ballard* 754, Waconia; *Taylor* 631, Minnesota lake; *Sheldon* 883, Sleepy Eye; *Herrick* 39, Minneapolis; *Holzinger* 21, Winona Co.; *Kassube* 30, Minneapolis; *Herrick* 40, Minneapolis; *Sandberg* 65, Cannon Falls; *Holzinger* 22, Winona Co., *Herb. Sheld.* 1912, Minneapolis; *Herb. Wickersheim* 16, Idlewild, Lincoln Co.; *Herb. Moyer* 30, Montevideo.

XLVI. CAPPARIDACEAE. Caper Family.

Endlicher, *Gen. Pl.* 889 (1840); Benth. and Hook., *Gen. Pl.* I, 103 (1862); Pax, *Engler and Prantl, Nat. Pflanz.* 3, II, 209 (1891); Baillon, *Hist. Pl.* III, 145 (1872).

Genera: 34; (Baillon, 17) and 1 fossil; warmer and tropical regions; frutescent forms strongly American.

Species: 350±; a few fossil, poorly known.

CLEOME LINN. Gen. 550 (1737).

Dianthera KLOTZSCH, Pet. Mosz. Bot. 160 (1858?).

Siliquaria and **Roridula** FORSK. Fl. Aeg. Arab. 35, 78 (1775).

Rorida R. and S. Syst. III, 13 (1818).

Atalanta NUTT. Gen. II, 73 (1818).

Peritoma DC. Prodr. I, 237 (1824).

Buhsia BUNGE, Linn. XXX, 752 (1859).

Anomalostemon KLOTZSCH, l. c. (1858?).

Baillon, *Hist. Pl.* III, 173; Benth. and Hook., *Gen. Pl.* I, 105; Engler and Prantl, *Nat. Pflanz.* 3, II, 222 (Pax); Durand, *Ind. Gen. Phan.* 20; Gray, *Ill. Gen.* I, 175; O. Kuntze, *Rev. Gen.* I, 38.

Living species: 70±; tropical and subtropical regions,

especially in S. America, where they are also subalpine and in Egypt and Arabia. Europe. 2; Japan, 0; North America, 6; Russia, 3; Calif., 3; Canada, 2; Rocky mts., 3; Pl. King, 4; S. Sts., 1; E. Sts., 1.

Cleome serrulata PURSH, Fl. Am. 441 (1814).

Peritoma integrifolia NUTT. Journ. Acad. Phil. VII, 14 (1842).

Peritoma serrulatum DC. Prodr. I, 237 (1824).

Cleome integrifolia T. and G. Fl. I, 122 (1838).

Wats. and Coult., Gray's Man. 6 ed. 75; Webb., Fl. Neb. 119; Coult., Fl. Colo. 28; Upham, Fl. Minn. 28; Mac., Fl. Can. I, 59; Roth., Wheel Exp. 67; Wats., King Exp. 32; Wats., Bibl. Ind. I, 76.

North America: Minn., Neb. and Kan.; W. to Colo., Mont. and adjacent Can.

Minn. valley: Blue Earth Co. and doubtless W. to Dakota line; local; sandy and waste places.

HERB.: *Leiberg 11*, Mankato.

JACKSONIA RAF. Med. Rep. N. Y., V. 352 (1808).

Polanisia RAF. Jour. Phys. LXXXIX, 98 (1819).

Corynandra SCHRAD. Ind. Sem. Gött. (1846).

Ranmanissa ENGL. Gen. 4988 b (1836-40).

Tetratelaia SOND. Fl. Cap. I, 58 (1859).

Chilocalyx, Decastemon and Symphyostemon KLOTZSCH, Pet. Mosz. Bot. 154 (1858).

Baillon, *Hist. Pl.* III, 173; Benth. and Hook., *Gen. Pl.* I, 106, 968; Durand, *Ind. Gen. Phan.* 21; Engler and Prantl, *Nat. Pflanz.* 3, II, 224 (Pax); Gray, *Ill. Gen.* I, 181; O. Kuntze, *Rev. Gen.* I, 38.

Living species: $30 \pm$; 14 (B. and H.); 15 (Durand); tropical and subtropical regions; 1 sp. in both hemispheres. North America, 4; Canada, 2; W. Tex., 2; S. Sts., 2; E. Sts., 2; King Pl., 1; Pl. Wheel., 2.

Jacksonia dodecandra (MICHX.).

Cleome dodecandra MICHX. Fl. Am. II, 32 (1803).

Jacksonia trifoliata RAF. Med. Repos. 352 (1808).

Polanisia graveolens RAF. Journ. Phys. 98 (1819).

Cleome viscosa SPRENG. Syst. II, 125 (1825) *in part.*

Polanisia dodecandra B. S. P. Cat. N. Y. 6 (1888).

Wats. and Coult., Gray's Man. 6 ed. 75; Britt., Fl. N. J. 53, Webb., Fl. Neb. 119; Coult., Fl. Colo. 27; Upham, Fl. Minn. 28; Mac., Fl. Can. I, 59, 491; Engl. Pax, *Nat. Pflanz.* III, 2, 224; Roth., Wheel. Exp. 68; Cov., Fl. Ark. 167; Wats., Bibl. Ind. I, 77.

North America: Q., Ont., L. Huron to N. W. T.; S. to Minn., Dak., Neb., Kan., Ark., Colo. in the west and Conn., Vt., N. J., Penn., Chesapeake bay; region S. of Gt. lakes,

Minn. valley: Throughout; sandy and drift covered places; along railway embankments; frequent.

HERB. *Sheldon* 699, Waseca; *Sheldon* 490, Madison Lake; *Taylor* 645, Minnesota lake; *Sheldon* 1217, New Ulm; *Sheldon* 1268, Lake Benton; *Sheldon* 803, Sigel township, Brown Co.; *Taylor* 840, Glenwood; *Ballard* 683, Waconia; *Ballard* 766, Waconia; *Leonard* 5, Minneapolis; *Leiberg* 10, Blue Earth Co.; *Holzinger* 26, Winona; *Oestlund* 15, Minneapolis; *Kassube* 34, Minneapolis; *Sandberg* 72, Cannon Falls; *Herb. Wickersheim* 18, Idlewild, Lincoln Co.

XLVII. SARRACENIACEAE. Pitcher-Plant Family.

Endlicher, *Gen. Pl.* 901 (1840); Benth. and Hook., *Gen. Pl.* I, 48 (1862); Baillon, *Hist. Pl.* III, 89 (1871)—under *Nymphaeaceae*. Wunschmann, *Engler and Prantl, Nat. Pflanz.* 3, II, 244 (1891).

Genera: 3; America; *Sarracenia* Linn. in Atl. N. America; *Chrysamphora* Greene, in Pac. N. America; *Heliamphora* Benth., in mts. of British Guiana.

Species: 8; 75 per cent. in *Sarracenia*.

SARRACENIA LINN. Gen. 420 (1737).

Baillon, *Hist. Pl.* III, 103; Benth. and Hook., *Hist. Pl.* I, 48; Engler and Prantl, *Nat. Pflanz.* 3, II, 251 (Wunschmann); Durand, *Ind. Phan.* 10; Gray, *Ill. Gen.* I, 107.

Living species: 6; 8 (Durand); Atlantic, and forest region, North America; S. Sts., 6; E. Sts., 2; Canada, 1-2.

Sarracenia purpurea LINN. Spec. 510 (1753).

Wats. and Coult., Gray's Man. 6 ed. 57; Britt. Fl. N. J. 44; Chap., Fl. S. St. 20; Upham, Fl. Minn. 22; Mac., Fl. Can. I, 33; Engl. Wunschm., *Nat. Pflanz.* III, 2, 251; Wats., *Bibl. Ind.* I, 39.

North America: Labrador and Newf. to N. S. and W. to Brit. Col.; N. to Bear lake and Mackenzie; S. to N. Eng. and Fla. ?; W. to Ohio and Minn.

Minn. valley: Only in N. portions of valley from Ft. Snelling to Glenwood; tamarack swamps; peat bogs and wet places.

HERB.: *Taylor* 1136, Glenwood; *Bailey* 288, Vermilion lake; *Kassube* 21, Minneapolis; *Oestlund* 11, Minneapolis; *Herrick* 23, Minneapolis; *Roberts* 7, Duluth; *Sandberg* 47, Center City, Chisago Co.; *Herb. Sheld.* 1682, Minneapolis; 1753, Ramsey Co.

XLVIII. DROSERACEAE. Sundew Family.

Endlicher, *Gen. Pl.* 906 (1840); Benth. and Hook., *Gen. Pl.* I, 661 (1865):

Baillon, *Hist. Pl.* IX, 225 (1888); Drude, *Engler and Prantl, Nat. Pflanz.* 3, II, 261 (1891).

Genera: 6; widely distributed, especially in Australia, Brazil, Cape of Good Hope and S—E. N. America.

Species: $100 \pm$; 90 per cent. in genus *Drosera*.

DROSERA LINN. Gen. 253 (1737).

Sondera LEHM. Pugill. VIII, 44 (1844).

Rossolis TOURN. Inst. 245 (1700).

Rorella RUPP. Fl. Jen. (1718).

Esera NECK. Elem. 859 (1790).

Baillon, *Hist. Pl.* IX, 233; Benth. and Hook., *Gen. Pl.* I, 662; Durand, *Ind. Gen. Phan.* 120; Engler and Prantl, *Nat. Pflanz.* 3, II, 270 (Drude); Gray, *Ill. Gen.* I, 193.

Living species: $90 \pm$; 100 (B. and H.); in all regions except Pac. isls.; very abundant in extra-tropical Australia. Russia, 3; Europe, 3–5; N. America, 8; Canada, 4; E. Sts., 4; S. Sts., 5; Calif., 2.

Drosera linearis GOLDIE, Edin. Phil. Journ. VI, 325 (1822).

Wats. and Coult., Gray's Man. 6 ed. 178; Upham, Fl. Minn. 30; Mac. Fl. Can. I, 166; Wats., Bibl. Ind. I, 354.

North America: Ont., Man. to Rockies; around L. Superior in Mich., Wis. and Minn.

Minn. valley: Far N. E. in valley and perhaps also in N. W.; bogs and mossy logs in deep woods.

Drosera intermedia DREV. and HAYNE, var. **americana** (WILLD.) DC. Prodr. I, 318 (1824).

Species: [*D. intermedia* DREV. and HAYNE, Abbild. Deutsch Gewach. I, 18 (1794–1801)].

D. foliosa ELL. Sk. I, 376 (1821).

D. longifolia LINN. Spec. 282 (1753) in part.

Variety: *D. americana* WILLD. Enum. 340 (1809).

Wats. and Coult., Gray's Man. 6 ed. 178; Chap., Fl. S. St. 37; Britt., Fl. N. J. 104; Hook., Fl. Gt. Brit. 150; Upham, Fl. Minn. 30; Brew. and Wats., Fl. Calif. 213; Regel, Fl. O.-Sib I, 258 in part; Mac., Fl. Can. I, 166; Led., Fl. Ross. I, 262; Nym., Fl. Eur.; Gris., Fl. W. I.; Herd., Fl. Eur. Russ. 22; Engl. Drude, Nat. Pflanz. III, 2, 271; Wats., Bibl. Ind. I, 354; Mac., Fl. Can. I, 529; Hart, Fl. Scan. I, 227 (spec.).

Species in N. Eur.; W. Asia; Kamtk.; Brazil. It is not the *D. longifolia* of Linn., which is a more comprehensive species, including also *D. anglica* Huds. It is, however, the *D. longifolia* of Michx. Fl. I, 186 (1803).

North America: Same range as that of *D. rotundifolia*, except that it extends only to 53° N. lat. and is not reported from the Pac. coast.

Minn. valley: Forest district, far N. W.; not common; peat bogs.

HERB.: *Herrick 48*, Minneapolis.

***Drosera rotundifolia* LINN. Spec. 282 (1753).**

Wats. and Coult., Gray's Man. 6 ed. 178; Britt., Fl. N. J. 104; Chap., Fl. S. St. 37; Brew. and Wats., Fl. Calif. I, 213; Upham, Fl. Minn. 30; Hook., Fl. Gt. Brit. 150; Regel, Fl. O.-Sib. I, 257; Mac., Fl. Can. I, 165; Led., Fl. Ross. I, 261; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 22; Engl. Drude, Nat. Pflanz. III, 2, 271; Wats., Bibl. Ind. I, 234; Hart., Fl. Scand. I, 227; Rothr., Alask. 444.

Arctic, N. and C. Europe; N. and W. Asia.

North America: Newf., Labrador, N, S. to Man. and Pac.; N. in arctic circle; S. in mts. to Mendocino Co., Calif.; along N. U. S. to Indiana and N. J.; S. in Appalachians to Florida.

Minn. valley: Forest district; Ft. Snelling to Blue Earth Co.; peat bogs.

HERB.: *Sheldon 353*, marshes S. of Lake Madison, Blue Earth Co.; *Taylor 1102*, Glenwood; *Roberts 16*, Minnesota Point; *Herrick 46*, Minneapolis; *Oestlund 18*, Ramsey Co.; *Kassube 41*, Rocky lake, Hennepin Co.

XLIX. CRASSULACEAE. Orpine Family.

Endlicher, *Gen. Pl.* 808 (1840); Benth. and Hook., *Gen. Pl.* I, 656 (1865); Baillon, *Hist. Pl.* III, 305 (1872); Schönland in *Engler and Prantl*, Nat. Pflanz. 3, IIa, 23 (1890).

Genera: 7-13; cosmopolitan; abundant in S. Africa.

Species: 375±.

PENTHORUM LINN. Gen. Corr. 957 (1737).

Baillon, *Hist. Pl.* III, 430; Benth. and Hook., *Gen. Pl.* I, 661; Durand, *Ind. Gen. Phan.* 119; Engler and Prantl, *Nat. Pflanz.* 3, IIa, 38 (Schönland).

Living species: 2; 1, E. North America; 1, China.

***Penthorum sedoides* LINN. Spec. 432 (1753),**

Wats. and Coult., Gray's Man. 6 ed. 176; Britt., Fl. N. J. 104; Mac., Fl. Can. I, 164; Webb., Fl. Neb. 125; Upham, Fl. Minn. 56; Chap., Fl. S. St. 151; Forbes and Hems., Fl. Sin. 228; Mac., Fl. Can. I, 528; Cov., Fl. Ark. 181; Engl. Schönl., Nat. Pflanz. III, 2, 38; Wats., Bibl. Ind. I, 350.

Manchuria; Japan; China.

North America: N. Br., Q., Ont. to N. Eng., N. J. and Fla.; W. to Minn., Neb., Kan., Ark. and Tex.

Minn. valley: Throughout at lower levels; open and wet localities.

HERB.: *Ballard* 813, Page lake, Carver Co.; *Ballard* 444, Prior's lake, Scott Co.; *Ballard* 611, Chaska; *Sheldon* 1371, Lake Benton; *Ballard* 694, Waconia; *Sheldon* 1197, New Ulm; *Herrick* 109, Minneapolis; *Kassube* 92, Minneapolis; *Holzinger* 78, Winona Co.; *Sandberg* 201, Cannon Falls; *Herb. Moyer* 84, Montevideo (a very large-leaved form).

L. SAXIFRAGACEAE. Saxifrage Family.

Endlicher, *Gen. Pl.* 813 (1840); 823—*Ribesiaceae*; 1186, *Philadelphaceae*; Lindl. *Veg. King*, 752, 569, 573, 750. 451 (1846)—*Escalloniaceae*, *Hydrangeaceae*, *Brexiaceae*, *Grossulariaceae*, *Francoaceae*; DC. *Prodr.* VII, 521 (1838-39); Benth. and Hook., *Gen. Pl.* I, 629 (1865)—excl. Trib. V, *Cunonieae*; Baillon, *Hist. Pl.* III, 325 (1872) *in part*; Engler *in Engler and Prantl*, *Nat. Pflanz.* 3, II a, 41 (1890).

Genera: 60; widely distributed.

Species: 450±; mostly "glacial plants."

SAXIFRAGA LINN. Gen. 368 (1737).

Mégasea, Antiphylla, Chondrosea, Muscaria, Lobaria, Spatularia, Dermasea, Aulaxis, Robertsonia, Miscopetalum, Leptasea, Hirculus, Ciliaria HAW. *Enum. Sax.* (1821).

Ligularia DUVAL, *Pl. Succ.* 11 (1819).

Kingstonia GRAY, *Brit. Pl.* II, 531 (1821).

Zahlbrucknera REICH. *Fl. Germ. Excurs.* 551 (1832).

Diptera BORKH. ex Baill. *Adans.* V, 282 (1865).

Hydatia NECK. *Elem.* (1790).

Oreosplenium ZAHLBR. ex Baill. *Adans.* V, 282 (1865).

Geryonia SCHUR. *Transsylv. Enum.* (1866).

Bergenia MOENCH, *Meth.* (1794).

Baillon, *Hist. Pl.* III, 424; Benth. and Hook., *Gen. Pl.* I, 635, 636; Durand, *Ind. Gen. Phan.* 116; Engler and Prantl, *Nat. Pflanz.* 3, II a, 52 (Engler); Schenck, *Palaeophyt.* 617.

Living species: 200±; mts. and arctic regions of N. hemisphere; a few widely distributed as glacial plants (Engler). Also, in the Andes of S. America. 160 (B. and H.); 180 (Durand). Russia, 57; Europe, 120 (in the Alps, for the most part); Russian Europe, 20; North America, 45; Canada, 35; Rocky mts., 18-20; California, 10; E. Sts., 11; Pl. King, 7; Pl. Wheel., 11; Alaska, 25±.

Fossil species: *S. oppositifolia*, Quaternary, England and Denmark.

Saxifraga pennsylvanica LINN. Spec. 399 (1753).

S. semipubescens SWEET, *Hort. Suburb.* 97 (1818).

S. palustris LINK, *Enum.* I, 412 (1821).

Micranthes pennsylvanica HAW. *Enum. Sax.* 45 (1821).

Evaiezoa pennsylvanica RAF. *Fl. Tell.* II, 71 (1836).

Wats. and Coult., *Gray's Man.* 6 ed. 170; Britt., *Fl. N. J.* 101; Upham,

Fl. Minn. 55; Mac., Fl. Can. I, 523; Engl., Nat. Pflanz. III; 2, 56; Wats., Bibl. Ind. I, 344.

North America: Ont. to N. Eng., N. J. and Va.; W. to Minn. and Iowa.

Minn. valley: N. E. district, and probably in whole forest district; tamarack swamps and bogs.

HERB.: *Ballard* 2, Chaska; *Kassube* 90, Minneapolis; *Holzinger* 76, Winona Co.; *Bailey* 329, St. Louis river; *Sandberg* 196, Goodhue Co.

TIARELLA LINN. Gen. ed. V, 495 (1754).

? *Blondea* NECK. Elem. 786 (1790).

Baillon, *Hist. Pl.* III, 426; Benth. and Hook., *Gen. Pl.* I, 637; Durand, *Ind. Gen. Phan.* 116; Engler and Prantl, *Nat. Pflanz.* 3, II a, 61 (Engler).

Living species: 5 described; 4 reduced (Engler); Himalayas and Japan 1; North America, 3; Canada, 3; E. Sts., 1; Rocky mts., 1; California, 1; S. Sts., 1. The included species (*T. laciniata* Hook.) is also Canadian.

Tiarella cordifolia LINN. Spec. 405 (1753).

Wats. and Coult., Gray's Man. 6 ed. 171; Britt., Fl. N. J. 101, Mac., Fl. Can. I, 156; Upham, Fl. Minn. 56; Chap., Fl. S. St. 154; Led., Fl. Ross. II, 229; Engl., Nat. Pflanz. 3, II a, 61; Wats., Bibl. Ind. I, 348.

N. W. Asia and Baikal Siberia.

North America: N. S., N. Br., Q., Ont. to N. Eng., N. J. and Penn.; W. to Ind. and Minn., and S. in Appalachians to Miss.

Minn. valley: Reported from Blue Earth Co. and probably sparingly throughout the forest district; rare; rocky places in woods.

HEUCHERA LINN. Gen. 196 (1737).

Baillon, *Hist. Pl.* III, 426; Benth. and Hook., *Gen. Pl.* I, 628; Durand, *Ind. Gen. Phan.* 116; Engler and Prantl, *Nat. Pflanz.* 3, II a, 62.

Living species: 24; Atlantic and Pacific N. America and mts. of Mexico. Canada, 7-8; Rocky mts., 10; California, 5; E. Sts., 5; S. Sts., 6; Pl. King, 4; Pl. Wheel., 3; W. Tex., 1.

Heuchera hispida PURSH, Fl. Am. 188 (1814).

H. richardsonii R. BR. Frankl. Journ. 766 (1823).

H. lucida SCHLECHT. Ind. Sem. Hal. (1848).

Wats. and Coult., Gray's Man. 6 ed. 172; Webb., Fl. Neb. 125; Mac., Fl. Can. I, 158; Upham, Fl. Minn. 55; Coult., Fl. Colo., 94; Chap., Fl. S. St. 152; Engl., Nat. Pflanz. 3, II a, 62; Wats., Bibl. Ind. I, 325; Wheelock, Torr. Bull. XVII, 198.

North America: Va. and N. Car. to Minn., Neb., Kan.; up Missouri river to Rocky mts., Canada; Saskatch.

and Man. to Peace river and Hudson Bay; lat. 54° N. to lat. 64° N.

Minn. valley: Throughout; common on exposed hill-sides, rocky ledges and high bluffs or headlands.

HERB.: *Taylor* 859, Glenwood; *Sheldon* 1174, New Ulm; *Sheldon* 1485, Pipestone city; *Sheldon* 785, Sleepy Eye; *Ballard* 100, Shakopee; *Ballard* 189, Jordan, Scott Co.; *Sandberg* 197, Red Wing; *Kassube* 91, Minneapolis; *Bailey* 431, Basswood lake; *Oestlund* 56, Minneapolis; *Herb. Sheld.* 1878, Minneapolis; *Herb. Moyer* 83, Carlton lake, Chippewa Co.

Heuchera americana LINN. Spec. 226 (1753).

H. scapigera MOENCH, Meth. 674 (1794).

H. cortusa MICHX. Fl. N. Am. I, 171 (1803).

H. viscida PURSH, Fl. Am. 187 (1814).

H. foliosa RAF. Herb. Torr.

H. reniformis RAF. Herb. Phil. Acad. Sci.

Wats. and Coult., Gray's Man. 6 ed. 172; Mac, Fl. Can. I, 158; Britt., Fl. N. J. 101; Upham, Fl. Minn. 55; Chap., Fl. S. St. 152; Cov., Fl. Ark. 180; Engl., Nat. Pflanz. 3, II a, 62; Wats., Bibl. Ind. I, 324; Wheelock, Torr. Bull. XVII, 195.

North America: S. Ont., N. Y., Conn., N. J. to Va. and N. Car.; W. to Minn., Mo., Ark. and Miss.

Minn. valley: Reported from N. E. and E. edge; rare; rocky woodlands.

HERB.: *Hammond* 1, Lake City.

MITELLA LINN. Gen. ed V, 496 (1754).

Drummondia DC. Prodr. IV, 49 (1830).

Mitellopsis MEISSN. Gen. 136 (1843).

? **Oreanthus** RAF. Ser. Bull. Bot. I, 216 (1830).

Baillon, *Hist. Pl.* III, 425; Benth. and Hook., *Gen. Pl.* I, 638; Durand, *Ind. Gen. Phan.* 116; Schenck, *Palaeophyt.* 617; Engler and Prantl, *Nat. Pflanz.* 3, II a, 63.

Living species: 7; North America, 6; Japan, 1; Canada, 6; Rocky mts., 2; California, 3; S. Sts., 1; E. Sts. 2; Pl. King, 2.

Fossil species: Amber, Germany? (*Caspary*).

Mitella nuda LINN. Spec. 406 (1753).

M. reniformis LAM. Ill. II, 395 (1793).

M. cordifolia LAM. Ill. II, 395 (1793).

M. prostrata MICHX. Fl. N. Am. I, 270 (1803).

Wats. and Coult., Gray's Man. 6 ed. 171; Mac., Fl. Can. I, 157; Upham, Fl. Minn. 55; Brew. and Wats., Fl. Calif. I, 200; Led., Fl. Ross. II, 228; Engl., Nat. Pflanz. 3, II a, 63; Wats., Bibl. Ind. I, 328.

W. and Baikal Siberia; N. and E. Siberia to Amurland.

North America: Labrador, N. S., N. B., Newf. to

Brit. Col., Arctic sea and Alaska; S. to N. Eng., N. Y., Mich., Minn., Dak. and Man.

Minn. valley: N. E. district and N. edge; mossy logs and deep woods; with *Drosera*; rare.

HERB.: *Herrick* 108, Minneapolis; *Sandberg* 199, Tower; *Roberts* 38, Grand Marais; *Bailey* 388, Mud lake; *Bailey* 88, Vermilion lake; *Sandberg* 200, Tower.

Mitella diphylla LINN. Spec. 406 (1753).

Wats. and Coult., Gray's Man. 6 ed. 171; Britt., Fl. N. J. 101; Mac., Fl. Can. I, 156; Upham, Fl. Minn. 55; Chap., Fl. S. St. 154; Led., Fl. Ross. II, 228?; Engl., Nat. Pflanz. 3, IIa, 63; Wats., Bibl. Ind. I, 328.; Brew. and Wats., Fl. Calif. I, 200.

E. Siberia?.

North America: Q., Ont., N. Eng., N. J. to N. Car.; W. to Minn. and Mo.; also Calif. and Oregon.

Minn. valley: Forest district; rich woods and along streams.

HERB.: *Holzinger* 77, Winona Co.; *Leiberg* 18, Blue Earth Co.; *Sandberg* 198, Vasa; *Hammond* 20, Lake City; *Herb. Sheld.* 1717, Minneapolis; *Herb. Sheld.* 1882, Ramsey Co.; *Herb. Wickersheim* 50, Mankato.

CHRYSOSPLENIUM LINN. Gen. 356 (1737).

Baillon, *Hist. Pl.* III, 425; Benth. and Hook., *Gen. Pl.* I, 638; Durand, *Ind. Gen. Phan.* 116; Engler and Prantl, *Nat. Pflanz.* 3, II a, 64 (Engler); Franchet, *Mon. Chrys.* (1891).

Living species: 54 (Franchet); 40 (Engler); 15 (Benth. and Hook.); 5, Amurland, 2 of these in Chile and Magellan; 3, N. America; 3, Europe; the rest in Himalayas, China and Manchuria; Canada, 2; Rocky mts. 1; S. Sts., 1; E. Sts., 2.

Chrysosplenium americanum SCHWEIN. Hook. Fl. Bor.-Am. I, 242 (1833).

C. oppositifolium WALT. Fl. Car. 140 (1788) *not* Linn.

Wats. and Coult., Gray's Man. 6 ed. 172; Britt., Fl. N. J. 101; Mac., Fl. Can. I, 158; Chap., Fl. S. St. 154; Engl., Nat. Pflanz. 3, II, 64; Wats., Bibl. Ind. I, 324.

North America: N. S., N. Br., Q., Ont. to Saskatchewan; S. to N. Eng., N. J. and N. Ga.; W. to Minn.

Minn. valley: Reported from N. edge and from far N. W.; wet places and bogs, with *Parnassia*; rare.

PARNASSIA LINN. Gen. 250 (1737).

Pyrola MOR. ex Adans. Fam. Pl. II, 449 (1763).

Euneadynamis GESN. ex Adans. l. c. (1763).

Baillon, *Hist. Pl.* III, 431; Benth. and Hook., *Gen. Pl.* I, 639; Durand, *Ind. Gen. Phan.* 117; Engler and Prantl, *Nat. Pflanz.* 3, II a, 66 (Engler).

Living species: 19; N. extra-tropical regions, mts. 12 (B. and H.); 14 (Durand); Russia, 9; Europe, 2; Russian-Europe, 2; North America, 6; Canada, 5; Rocky mts., 3-4; E. Sts., 4; Pl. King, 2; Pl. Wheel., 2; California, 2.

Parnassia caroliniana MICHX. Fl. N. Am. I, 184 (1803).

P. americana and *ovata* MUHL. Cat. 32 (1813).

P. palustris PURSH, Fl. Am. 208 (1814).

P. rotundifolia, *grandiflora*, *glauca*, *repanda* RAF. Aut. Bot. 41, 42 (1836).

Wats. and Coult., Gray's Man. 6 ed. 173; Mac., Fl. Can. I, 159, 527; Britt., Fl. N. J. 102; Upham, Fl. Minn. 55; Chap., Fl. S. St. 38; Cov., Fl. Ark. 181; Engl., Nat. Pflanz. 3, II, 67; Wats., Bibl. Ind. I, 329.

North America: Anticosti, N. Br., Ont. to L. Huron reg. and Man.; S. to N. Eng., N. J., Fla.; W. to Minn., Iowa and Ark. to La.

Minn. valley: N. E. and N. W. districts; bogs and cold marshes; probably also in whole forest district.

HERB.: *Taylor* 1011, Glenwood; *Ballard* 619, Shakopee; *Oestlund* 55, Minneapolis; *Herrick* 107, Minneapolis; *Sandberg* 195, Red Wing; *Herb. Sheld.* 1665, Minneapolis.

Parnassia palustris LINN. Spec. 273 (1753).

Wats. and Coult., Gray's Man. 6 ed. 173; Mac., Fl. Can. I, 159; Coult., Fl. Colo. 95; Hook., Fl. Gt. Brit. 143; Trautv., Fl. Sib. 29; Upham, Fl. Minn. 55; Forbes and Hems., Fl. Sin. I, 272; Led., Fl. Ross. I, 262; Regel, Fl. O.-Sib. I, 259; Nym., Fl. Eur.; Mac., Fl. Can. I, 527; Miyabe, Fl. Kur. 234; Herd., Fl. Eur. Russ. 56; Engl., Nat. Pflanz. 3, II, 76; Wats., Bibl. Ind. I, 330; Hart., Fl. Scand. I, 227.

Siberia, Corea, Kuriles, Russia to Caucasus and Carpathian Mts?.

North America: Labrador, Newf. and Maritime provinces to Arctic sea, Brit. Col., Pac. and Alaska; S. to Mich., N. Minn., Mont. and Wyoming.

Minn. valley: N. W. in Chippewa valley and probably sparingly in N. E. district; bogs and springsides.

HERB.: *Taylor* 751, Glenwood; *Taylor* 1039, Glenwood; *MacM.* and *Sheld.* 38, Brainerd.

RIBES LINN. Gen. 195 (1737).

Grossularia TOURN. Inst. 639 (1700).

Botryocarpium RICH. Elem. II, 487 (1831).

Chrysobotrya, **Cerophyllum** and **Coreosma** SPACH, Suit. Buff. VI, 148-180 (1839).

Calobotrya and **Rebis** SPACH, Ann. Sci. Nat. Ser. 2, IV, 21-26 (1835).

Robsonia BERL. Mem. Gen. III, 1 (1823).

Baillon, *Hist. Pl.* III, 446; Benth. and Hook., *Gen. Pl.* I, 654; Durand,

Ind. Gen. Phan. 119; Schenck, *Palaeophyt.* 622; Engler and Prantl, *Nat. Pflanz.* 3, II a, 88 (Engler).

Living species: 50; N. temperate regions, mts. of Central America and Andes to Magellan. 75, (Durand); Russia, 20+; Europe, 6; Russian Europe, 5; North America, 23, Canada, 17-18; Rocky mts., 13-15; E. Sts., 9; California, 12-14; S. Sts., 5; Pl. King, 11; Pl. Wheel., 7; W. Tex., 2.

Fossil species: Tertiary?; *R. nigrum* in Quaternary, marl beds.

***Ribes rubrum* LINN. var. *albinervium* (MICHX.).**

R. albinervium MICHX. Fl. I, 110 (1803).

R. rubrum var. *subglandulosum* MAXIM. Bull. Acad. Petersb. XIX, 256 (1878).

R. rubrum AUCT. AMER.

Wats. and Coult., Gray's Man. 6 ed. 176; Upham, Fl. Minn. 54; Mac., Fl. Can. I, 162; Webb., Fl. Neb. 125; Hook., Fl. Gt. Brit. (spec.) 144; Trautv., Fl. Sib. (spec.) 57; Led., Fl. Ross. (spec.) II, 199; Nym., Fl. Eur. (spec.); Herd., Fl. Eur. Russ. (spec.) 54; Engl., Nat. Pflanz. 3, II, 92 (spec.); Wats., Bibl. Ind. I, 336; Hart., Fl. Scand. I, 252.

Europe and N. and W. Asia to Himalayas (species).

North America: Atl. to Pac., Arctic sea and Alaska, in Canada; S. to N. Eng. and Va.; W. to Ky., Iowa, Minn. and E. Neb. (variety).

Minn. valley: N. E. district and N. edge; reported from N. W. district; cold woods and neighborhood of springs.

HERB.: *Bailey* 115, Vermilion lake; *Kassube* 89, Minneapolis; *Roberts* 37, Little Marais; *Bailey* 222, Vermilion lake; *Bailey* 454, Mud lake; *Herb. Sheld.* 1883, Minneapolis.

***Ribes floridum* L'HER. Stirp. I, 4 (1784).**

R. nigrum var. *B.* LINN. Spec. 201 (1753).

R. nigrum var. *pennsylvanicum* MARSH. Arbust. 132 (1785).

R. campanulatum MOENCH, Meth. 683 (1794).

R. recurvatum MICHX. Fl. N. Am. I, 109 (1803).

Coreosma florida SPACH, Hist. Veg. VI, 157 (1834).

Wats. and Coult., Gray's Man. 6 ed. 176; Britt., Fl. N. J. 103; Mac., Fl. Can. I, 163; Upham, Fl. Minn. 54; Webb., Fl. Neb. 125; Coult., Fl. Colo. 97; Cov., Fl. Ark. 181; Engl., Nat. Pflanz. 3, II, 91; Wats., Bibl. Ind. I, 333.

South America—Andes mts., 2400 m. alt.; Quito.

North America: N. S., N. Br., Q., Ont. to Man. and lat 54° N.; S. to Va., Ky., Iowa, Minn., Neb., Ark. and Colo.; N. Platte river.

Minn. valley: Throughout, common; woods and edges of sloughs.

HERB.: *Sheldon* 1600, Lake Benton; *Sheldon* 16, Elysian; *Herrick* 105, Minneapolis; *Oestlund* 54, Hennepin Co.; *Hol-*

zinger 75, Winona Co.; *Herrick* 106, Minneapolis; *Bailey* 108, Vermilion lake; *Bailey* 77, Vermilion lake; *Kassube* 88, Minneapolis; *Sandberg* 191, Red Wing; *Herb. Sheld.* 1880, Minneapolis; *Herb. Wickersheim* 49, Idlewild; *Herb. Moyer* 82, Chippewa river near Montevideo.

***Ribes oxycanthoides* LINN. Spec. 201 (1753).**

R. hirtellum MICHX. Fl. N. Am. I, 111 (1803).

? *R. triflorum* BIGEL. Fl. Bost. 2 ed. 90 (1824).

R. saxosum HOOK. Fl. Bor.-Am. I, 231 (1833).

Grossularia oxycanthoides and *hirtella* SPACH, Hist. Veg. VI, 175, 180 (1834).

R. irriguum GRAY, Pl. Fendl. 53 (1849).

Wats. and Coult., Gray's Man. 6 ed. 175; Britt., Fl. N. J. 102; Mac., Fl. Can. I, 161; Coult., Fl. Colo. 96; Brew. and Wats., Fl. Calif. I, 206; Wats., King Exp. 97; Roth., Wheel. Exp. 117; Engl. Focke, Nat. Pflanz. 3, II, 90; Wats., Bibl. Ind. I, 335; Greene, Fl. Fran. 199.

North America: N. S., N. Br., Newf. to California; N. to Brit. Col. and Hudson Bay; S. to N. J., Ind., Minn., Colo., Man.; Sierras to 3000 m. alt.

Minn. valley: Reported from E., N. E. and N. W. districts; rare; rocky woods or barren places.

***Ribes gracile* MICHX. Fl. N. Am. I, 111 (1803).**

R. niveum LINDL. Bot. Reg. 1692 (1830).

R. missouriensis NUTT. T. and G. Fl. I, 548 (1838).

R. rotundifolium var. — ENGELM. Pl. Upp. Miss. 193 (1861).

R. rotundifolium UPHAM, Fl. Minn. 54 (1884).

Wats. and Coult., Gray's Man. 6 ed. 175; Mac. Fl. Can. 161; Chap., Fl. S. St. 145; Coult., Fl. Colo. 96; Webb., Fl. Neb. 125; Engl., Nat. Pflanz. 3, II, 90; Wats., Bibl. Ind. I, 333; Webb., Appx. Neb. 33.

North America: Ont?, Mich. to Minn., Neb., Colo., Tenn., Rocky mts. and W. Tex.

Minn. valley: Forest district and W. to Pomme des Terre valley; rocky woods and along streams.

HERB.: *Ballard* 668, Waconia; *Sheldon* 457, Madison Lake; *Sheldon* 806, Sigel township, Brown Co.; *Herrick* 104, Minneapolis; *Kassube* 87, Minneapolis; *Sandberg* 193, Red Wing; *Holzinger* 74, Winona; *Herb. Moyer* 81, Chippewa river, near Montevideo.

***Ribes cynobasti* LINN. Spec. 202 (1753).**

R. gracile TORR. Fl. U. S. 269 (1824).

Grossularia cynobasti SPACH, Hist. Veg. VI, 178 (1834).

Ribes oxycanthoides var. *G.* T. and G. Fl. I, 546 (1838).

Wats. and Coult., Gray's Man. 6 ed. 175; Britt., Fl. N. J. 102; Mac., Fl. Can. I, 161, 527; Upham, Fl. Minn. 54; Webb., Fl. Neb. 125; Chap., Fl. S. St. 145; Engl., Nat. Pflanz. III, 3, 91; Wats., Bibl. Ind. I, 332.

North America: N. Br., Q., Ont. to Man.; S. to N. Eng., N. J. and N. Car.; W. to Minn., Neb., Ky., Mo. and to San Francisco mts. of Arizona.

Minn. valley: Throughout, but infrequent far W.; woods and waste places along streams.

HERB.: *Taylor* 273, Janesville; *Sheldon* 461, Madison Lake; *Sheldon* 53, Elysian; *Taylor* 804, Glenwood; *Sheldon* 856, Sleepy Eye; *Ballard* 83, Chaska; *Kassube* 86, Minneapolis; *Sandberg* 192, Goodhue Co.; *Herb. Sheld.* 1881, Minneapolis.

LI. ROSACEAE. Rose Family.

Endlicher, *Gen. Pl.* 1240 (1840); *Chrysobalanaceae* Endl. *Gen. Pl.* 1251; *Amygdaleae*, Endl. *Gen. Pl.* 1250; *Pomaceae* Endl. *Gen. Pl.* 1236 (1840); *Drupaceae*, *Sanguisorbaceae* Lindl. *Veg. King.* 559, 561 (1846); Benth. and Hook. *Gen. Pl.* I, 600 (1865); Baillon, *Hist. Pl.* I, 345 (1869); Focke, in *Engler and Prantl, Nat. Pflanz.* 3, III, 1 (1888).

Genera: 70±; 90 (Focke); 71 (B. and H.); 66 (Baillon); cosmopolitan.

Species: 1200–1500; two great distributional regions: (1) Pacific coast and border regions; (2) N. temperate zone. Fossil species known from the Tertiary and Recent and even from Upper Cretaceous of N. America, sparingly.

OPULASTER MEDIC. *Beitr. Pflanzenanat.* II, 109 (1799).

Physocarpus CAMBESS. *Ann. Sci. Nat.* I, 385 (1824).

Neillia DON, *Prodr. Nep.* 228 (1825).

Adenileima BL. *Bij.* 1121 (1826).

Epicostorus RAF. *Atl. Jour.* 144 (1832),

Physocarpa RAF. *Fl. Tell.* (1836).

Stephanandra SIEB. ET ZUCC. *Abh. Münch. Akad.* III, 739 (—).

Baillon, *Hist. Pl.* I, 470, 471; Benth. and Hook., *Gen. Pl.* I, 612; Durand, *Ind. Gen. Phan.* 112; Engler and Prantl, *Nat. Pflanz.* 3, III, 14 (Focke); O. Kuntze, *Rev. Gen. Nachtr.* 949; Schenck, *Palaeophyt.* 674.

Living species: 9, in three distinct sections (*Neillia*, *Physocarpus* and *Stephanandra*); North America; N. Asia to Himalayas; S. China and Japan. North America, 2 sp.; 1, Rocky mts. and Calif.; 1, E. Sts.

Fossil species: *O. opulifolius* (Linn.) in Tertiary of Siberia; also, Alaska? Hungary? (*Heer, Unger*).

Opulaster opulifolius (LINN.) OK. *Rev. Gen.* II, 949 (1891).

Spiraea opulifolia LINN. *Spec.* 489 (1753).

S. caroliniana MARSH. *Arbust. Amer.* 146 (1785).

Opulaster bullatus MED. *Pflanzenanat.* II, 109 (1799)

Physocarpus opulifolius RAF. *N. Fl.* III, 73, 74 (1836)

Neillia opulifolia B. and H. *Gen. Pl.* I, 612 (1865).

Wats. and Coult., Gray's Man. 6 ed. 153; Britt., Fl. N. J. 92; Webb., Fl. Neb. 129; Chap., Fl. S. St. 120; Upham, Fl. Minn. 48; Brew. and Wats., Fl. Calif. I, 171; Herd., Fl. Eur. Russ. 46; Coult., Fl. Colo. 78; Mac., Fl. Can. I, 127; Wats., Bibl. Ind. I, 289; Wats., King Exp. 80; Roth., Wheel. Exp. 110; Cov., Fl. Ark. 179; Engl. Focke, Nat. Pflanz. 3, III, 14.

North America: Q., Ont. to Man. and Saskatchewan; W. to Vancouver in var.; N. England to Fla.; W. to Minn., Kan., Colo., Neb., Ark., Calif. to Brit. Col.

Minn. valley: Forest district, especially N. E.; probably also far N. W.; rocky banks and edges of sloughs.

HERB.: *Kassube* 64, Minneapolis; *Sandberg* 155, Goodhue Co.; *Oestlund* 39, Minneapolis; *Herrick* 86, Minneapolis; *Sandberg* 156, Cannon Falls.

SPIRAEA LINN. Gen. 409 (1737).

Petrophytum NUTT. ex B. and W. Fl. Calif. I, 170 (1880).

Baillon, *Hist. Pl.* I, 469; Benth. and Hook., *Gen. Pl.* I, 611; Durand, *Ind. Gen. Phan.* 112; Engler and Prantl, *Nat. Pflanz.* 3, III, 14; Schenck, *Palaeophyt.* 674.

Living species: 40±; temperate Northern hemisphere and a few in mts. under the tropics. Russia, 16; Europe, 11; North America, 4-5; Mexico, 1; E. Sts., 3; Rocky mts., 3; W. coast region, 3; Oregon and Canada, 3.

Fossil species: Several described. Oeningen, Tertiary 1 sp. (*Heer*); Alaska, 2-3 (*Heer*); Leoben (*Ettinghausen*).

Spiraea tomentosa LINN. Spec. 489 (1753).

S. ferruginea, glomerata, rosea RAF. N. Fl. III, 62, 63 (1836).

Wats. and Coult., Gray's Man. 6 ed. 153; Britt., Fl. N. J. 93; Upham, Fl. Minn. 48; Chap., Fl. S. St. 120; Mac., Fl. Can. I, 126; Cov., Fl. Ark. 179; Engl. Focke, Nat. Pflanz. 3, III, 15; Wats., Bibl. Ind. I, 322.

North America: N. S., N. Br., Q., Ont. to N. Eng., N. J. and Ga.; W. to Minn., Kan. and Ark.

Minn. valley: Ft. Snelling and far N. E. in Dakota Co.; edges of sloughs and forest marshes.

HERB.: *Sandberg* 159, Chisago Co.

Spiraea salicifolia LINN. Spec. 489 (1753).

S. tomentosa var. *alba* MARSH. Arbust. Amer. 147 (1785).

S. carpinifolia WILLD. Enum. 540 (1809).

S. amoena, ciliata, obovata RAF. N. Fl. III, 64-66 (1836).

Wats. and Coult., Gray's Man. 6 ed. 153; Britt., Fl. N. J. 93; Wats., Bibl. Ind. I, 322; Upham, Fl. Minn. 48; Chap., Fl. S. St. 121; Trautv., Fl. Sib. 48; Hook., Fl. Gt. Brit. 116; Mac., Fl. Can. I, 126; Forbes and Hems., Fl. Sin. 227; Led., Fl. Ross. II, 15; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 46; Engl. Focke, Nat. Pflanz. 3, III, 15; Hart., Fl. Scand. I, 292; Rothr., Alask. 445.

S. and Mid. Russ. to Hungary; all Siberia and Manchuria; China; intro. in W. Europe.

North America: Newf., N. S. to Rocky mts.; N. on Mackenzie to Arctic sea; Alaska; S. to N. Eng., N. J. and Ga.; W. to Minn., Mo. and Ark.

Minn. valley: Throughout; wet places, edges of prairie sloughs and forest-meadows.

HERB.: *Ballard* 508, Prior's lake, Scott Co.; *Ballard* 721, Benton, Carver Co.; *Ballard* 877, Waconia; *Taylor* 866, Glenwood; *Sheldon* 356, Smith's Mills, Blue Earth Co.; *Taylor* 719, Minnesota lake; *Sheldon* 920, Sleepy Eye; *Sheldon* 615, Wilton, Waseca Co.; *Herrick* 87, Minneapolis; *Sandberg* 157, Red Wing; *Kassube* 64, Minneapolis; *Bailey* 95, Vermilion lake; *Herb. Moyer* 69, Chippewa Co.

PIRUS LINN. Gen. 145 (1737).

Sorbus LINN. Gen. 144 (1737).

Malus RUPP. Fl. Jen. ed. 3, 141 (1745).

Cydonia, Malus, Sorbus, Pirus TOURN. Inst. 628, seq. (1700).

Torminalis, Lazarolus, Aucuparia and Chamaemespilus

MEDIC. Phil. Bot. I, 134-138 (1789).

Piophorum, Apiophorum NECK. Elem. II, 72 (1790).

Hahnia MEDIC. Gesch. Bot. 81 (1793).

Azarolus BORKH. Handb. Forst. Bot. II, 1224 (1800).

Aronia PERS. Syn. II, 39 (1807) excl. *Amelanchier*.

Aria HOST. Fl. Austr. II, 7 (1831).

Cormus SPACH, Suit. Buff. II, 96 (1834).

Torminaria ROEM. Syn. Monog. III, 101 (1847).

Micromeles DECNE. Nouv. Arch. Mus. X, 168 (1861).

Chloromeles DECNE. Fl. Serr. XXIII, 156 (—).

Baillon, *Hist. Pl.* I, 475; Benth. and Hook., *Gen. Pl.* I, 626; Durand, *Ind. Gen. Phan.* 114; Engler and Prantl, *Nat. Pflanz.* 3, III, 22 (Focke); Schenck, *Paleophyt.* 671; Sargent, *N. Am. Silva* IV, 67.

Living species: 50-60 or less; temperate N. hemisphere, mts. of tropical India. Russia, 20; Himalayas, 22; Europe, 15; Russian Europe, 11; N. America, 7; Canada, 6; E. Sts., 5; S. Sts., 4; Mid. Calif., 1; Rocky mts., 1; Pl. King, 1.

Fossil species: Several; Tertiary of Spitzbergen and Greenland (*Heer.*); Japan (*Nathorst*); Bilin (*Ettinghausen*); Cretaceous, Kansas (*Newberry*); Europe (*Unger*); Tuscany (*Gaud.*); Quaternary travertines, Kutschlin (*Ettinghausen* and *Engler*).

Pirus sambucifolia CHAM. and SCHLECHT. Linn. II, 36 (1827).

Sorbus aucuparia var. *B.* MICHX. Fl. Bor.-Am. I, 290 (1803).

S. aucuparia SCHRANK, Pl. Labr. 25 (1830?) in part.

Pyrus americana NEWBERRY, Pac. R. R. Rep. VI, 73 (1857).

P. aucuparia MEYER, Pl. Labr. 81 (1830) *in part*.

Sorbus sambucifolia ROEM. Syn. Monog. III, 139 (1847).

S. sitchensis ROEM. Syn. Monog. III, 139 (1847).

Wats. and Coult., Gray's Man. 6 ed. 164; Mac., Fl. Can. I, 146; Upham, Fl. Minn. 53; Brew. and Wats., Fl. Calif. I, 189; Coult., Fl. Colo. 89; Trautv., Fl. Sib. 54?; Led., Fl. Ross. II, 99; Wats., King Exp. 92; Wats., Bibl. Ind. I, 292; Nym., Fl. Eur.; Miyabe, Fl. Kur. 222; Rothr., Alask. 446; Sarg., N. Am. Silva IV, 81.

Europe?, N. and W. Asia; Manchuria and Siberia to Saghalin, Kurile Isls. and Japan.

North America: Greenland and maritime provinces to Man., Brit. Col., N. W. T. and Alaska; S. to N. Eng.; W. to L. Superior region and Minn.; S. in mts. to Mexico? and Yosemite valley.

Minn. valley; Reported from vicinity of Ft. Snelling; doubtful; N. E. district; edges of woods.

HERB.: *Bailey 18*, Vermilion lake.

***Pirus arbutifolia* (LINN.) LINN. f. Suppl. 256 (1781).**

Mespilus arbutifolia LINN. Spec. 478 (1753) *p. p.*

Crataegus pyrifolia LAM. Enc. Meth. I, 83 (1783).

Aronia pyrifolia PERS. Syn. II, 39 (1807).

Crataegus serrulata POIR. Suppl. I, 292 (1810).

Aronia arbutifolia ELL. Sk. I, 556 (1821).

Pirus floribunda LINDL. Bot. Reg. 1006 (1830).

Aronia depressa SPACH, Suit. Buff. II, 88 (1834).

Sorbus arbutifolia WENZIG, Linn. XXXVIII, 65 (1864).

Wats. and Coult., Gray's Man. 6 ed. 164; Britt., Fl. N. J. 99; Mac., Fl. Can. I, 144; Chap., Fl. S. Sts. 128; Upham, Fl. Minn. 52; Cov., Fl. Ark. 180; Engl. Focke, Nat. Pflanz. 3, III, 25; Wats., Bibl. Ind. I, 291.

North America: Newf., N. S., Q., Ont. to N. Y., N. J. and Fla.; W. to Minn., Mo., Neb., Ark. and La.

Minn. valley: Reported from E. edge of valley and from vicinity of Ft. Snelling; thickets and edges of woods.

HERB.: *Sandberg 189*, Chisago lake.

***Pirus coronaria* LINN. Spec. 480 (1753).**

Malus coronaria MILL. Dict. (1768).

Crataegus coronaria SALISB. Prodr. 357 (1796).

Pyrus coronaria var. *iowensis* WOOD, Cl.-Book. Rev. ed. 333 (1870).

Malus microcarpa coronaria CARRIERE, Pom. Microcarp. 133 f. 17 (1884).

Pyrus iowensis BAILEY, Am. Gard. XII, 473 (1889).

Sorbus coronaria MACM. MSS. (1891).

Wats. and Coult., Gray's Man. 6 ed. 164; Chap., Fl. S. St. 128; Upham, Fl. Minn. 53; Webb., Fl. Neb. 127; Mac., Fl. Can. I, 145; Britt., Fl. N. J. 98; Coult. Fl. Tex. 106; Cov., Fl. Ark. 180; Engl. Focke, Nat. Pflanz. 3, III, 24; Wats., Bibl. Ind. I, 292; Sarg., N. Am. Silva IV, 71.

North America: Ontario to Lake Huron; N. Y. and Penn. to N. Car. and C. Alab.; W. to Minn., Neb., Kan., Ark., Ind. Terr., La. and W. Tex.

Minn. valley: S. central district and perhaps throughout the forest region; Leaf hills? woods and streams.

HERB.: *Sheldon* 322, Smith's Mills, Blue Earth Co.; *Ballard* 345, Helena, Scott Co.; *Sheldon* 659, Waseca; *Sandberg* 188, Red Wing; *Herb. Wickersheim* 48, Mankato.

AMELANCHIER MEDIC. Phil. Bot. I, 135, 155 (1789).

Aronia PERS. Syn. II, 39 (1807) *in part*.

Baillon, *Hist. Pl.* I, 477; Benth. and Hook., *Gen. Pl.* I, 628; Durand, *Ind. Gen. Phan.* 115; Schenck, *Palaeophyt.* 671; Engler and Prantl, *Nat. Pflanz.* 3, III, 26 (Focke); Sargent, *N. Am. Silva* IV, 125.

Living species: 6, closely related; N. temperate regions. Russia, 1; Europe, 1; North America, 3; E. Sts., 2; Canada, 3; S. Sts., 1-2; Rocky mts., 1; Calif., 3; Pl. King., 1; Pl. Wheel., 1; also, Mexico 1 other? Japan, 1; Orient, 1.

Fossil species: Tertiary, Florissant, Colo. (*Lesquer-eaux, Newberry*); Europe, (*Ettinghausen*), 4-5.

Amelanchier alnifolia NUTT. Journ. Acad. Phil. VII, 22 (1835).

Pirus sanguinea PURSH, Fl. Am. 340 (1814).

Aronia alnifolia NUTT. Gen. I, 306 (1818).

Pirus alnifolia SPRENG. Syst. II, 509 (1825).

Amelanchier ovalis var. *semiintegrifolia* HOOK. Fl. Bor.-Amer. I, 202 (1833).

A. florida LINDL. Bot. Reg. 1589 (1835).

A. canadensis var. *alnifolia* T. and G. Fl. I, 473 (1838).

A. canadensis var. *pumila* T. and G. Fl. I, 474 (1838).

A. pumila ROEM. Syn. Monog. III, 145 (1847).

A. canadensis var. *oblongifolia* BENTH. Pl. Hartw. 309 (1846).

A. diversifolia var. *alnifolia* TORR. Frém. Rep. 89 (1858).

A. canadensis ANDERSON, Cat. Pl. Nev. 120 (—).

Wats. and Coult., Gray's Man. 6 ed. 167; Mac., Fl. Can. I, 148, 522; Webb., Fl. Neb. 127; Upham, Fl. Minn. 53; Coult., Fl. Colo. 89; Brew. and Wats., Fl. Calif. I, 190; Greene, Fl. Fran. 52; Roth., Wheel, Exp. 116; Wats., King Exp. 92; Sarg., N. Am. Silva IV, 131.

North America: N. Mich., Minn., Neb. to Brit. Col., Vancouver, Charlotte Isls. and Peace river reg.; S. to Calif.; S. in mts. to Colo. and Arizona; N. to Alaska and N. lat. 62° 45'.

Minn. valley: N. E. district; thickets and banks of streams.

Amelanchier canadensis (LINN.) MEDIC. Gesch. Bot. 79 (1783).

Mespilus canadensis LINN. Spec. 478 (1753).

Pyrus botryapium LINN. f. Suppl. 255 (1781).

Crataegus racemosa LAM. Enc. Meth. I, 84 (1783).

Mespilus nirea MARSH. Arbust. Amer. 90 (1785).

Amelanchier canadensis var. *prunifolia* CASTIGL. Viag. St. Uni. II, 293 (1800).

Mespilus amelanchier CASTIGL. Viag. St. Uni. II, 293 (1800).

M. canadensis var. *cordata* MICHX. Fl. N. Am. I, 291 (1803).

Amelanchier botryapium BORKH. Handb. Forstb. II, 1260 (1800).

Aronia botryapium PERS. Syn. II, 39 (1807).

Mespilus arborea MICHX. f. Arb. Am. III, 68 (1813).

Aronia arborea BART. Comp. Fl. Phil. I, 228 (1818).

Amelanchier sanguinea LINDL. Bot. Reg. t. 1171 (—).

Aronia cordata RAF. Med. Fl. II, 106 (1830).

Amelanchier ovalis HOOK. Fl. Bor.-Am. I, 202 (1833).

A. canadensis var. *botryapium* T. and G. Fl. I, 473 (1838).

Pyrus bartramiana TAUSCH, Flora II, 715 (1838).

P. wangenheimiana TAUSCH, Flora II, 715 (1838).

Amelanchier bartramiana and *wangenheimiana* ROEM. Syn. Monog. III, 145, 146 (1847).

Wats., and Coult., Gray's Man. 6 ed. 166; Mac., Fl. Can. 148; Chap., Fl. S. St. 129; Webb., Fl. Neb. 127; Britt., Fl. N. J. 100; Upham, Fl. Minn. 53; Wats., King Exp. 92; Cov., Fl. Ark. 180; Engl. Focke, Nat. Pflanz. 3, III, 26; Wats., Bibl. Ind. I, 272; Sarg., N. Am. Silva IV, 127.

North America: Newf., N. S., N. Br., Q., Ont., L. Huron reg. and L. Superior reg.; S. to N. J. and Fla.; W. to Minn., Dak., Neb., Kan., Ark. and La.

Minn. valley: Throughout; banks of streams and shores of lakes.

HERB.: *Sheldon* 1358, Lake Benton; *Sheldon* 905, Sleepy Eye; *Sheldon* 625, Wilton, Waseca Co.; *Sheldon* 945, Redwood Falls; *Taylor* 409, Janesville; *Holzinger* 73, Winona Co.; *Sandberg* 190, Red Wing; *Herrick* 102, Minneapolis; *Kasube* 84, Minneapolis; *Bailey* 2, Vermilion lake; *Herb. Sheld* 1856, Ramsey Co.

***Amelanchier canadensis* (LINN.) MEDIC. var. *obovalis* (MICHX.) B. S. P. Cat. N. Y. (1888).**

Mespilus canadensis var. *obovalis* MICHX. Fl. N. Am. I, 291 (1803).

Pyrus sanguinea PURSH, Fl. Am. I, 340 (1814) in part.

P. ovalis BIGEL. Fl. Bost. ed. 2, 195 (1824).

Aronia ovalis TORR. Fl. U. S. 479 (1824).

Amelanchier ovalis DC. Prodr. II, 632 (1825).

A. intermedia SPACH, Hist. Veg. II, 85 (1834).

A. canadensis var. *oblongifolia* T. and G. Fl. I, 473 (1838).

A. oblongifolia ROEM. Syn. Monog. 147 (1847).

A. spicata DECN. Mem. Fam. Pom. 135 (1875).

Wats. and Coult., Gray's Man. 6 ed. 167; Britt., Fl. N. J. 100; Mac., Fl. Can. 149; Upham, Fl. Minn. 53; Cov., Fl. Ark. 180; Wats., Bibl. Ind. I, 273; Sarg., N. Am. Silva IV, 128.

North America: N. S., N. Br., Q., Ont., Man., Saskatchewan, Brit. Col. to Rocky mts. and N. on Mackenzie river; S. to N. J., Va.; W. to Minn., Mo. and Ark.

Minn. valley: Throughout; banks of streams and shores of lakes.

HERB.: *Taylor* 602½, Minnesota lake; *Ballard* 359, Helena, Scott Co.; *Sandberg* 191, Cannon Falls; *Sandberg* 192, Cannon Falls; *Kassube* 85, Minneapolis; *Roberts* 36, Devil's Track river; *Herrick* 103, Minneapolis; *Bailey* 407, Burntside lake; *Herb. Sheld.* 1857, Ft. Snelling; *Herb. Moyer* 80, Montevideo; *Wickersheim* 136, Ash lake, Lincoln Co.; *Herb. Moyer* 249, Montevideo.

CRATAEGUS LINN. Gen. 404 (1737).

Mespilus LINN. Gen. 407 (1737).

Oxyacantha RUPP. Fl. Jen. ed. 3, 136 (1745).

Mespilophora NECK. Elem. 724 (1790).

Halmia, *Anthomeles*, *Phaenopyrum* ROEM. Syn. Monog. III, 101-103 (1847).

Phalacros WENZIG, Linn. XXXVIII, 164 (1864).

Timbalia CLOS, ex Dur. Ind. Gen. Phan. 115 (1888).

Sportella HANCE, ex Dur. l. c. (1888).

Baillon, *Hist. Pl.* I, 475; Benth. and Hook., *Gen. Pl.* I, 626; Durand, *Ind. Gen. Phan.* 115; Engler and Prantl, *Nat. Pflanz.* 3, III, 26; Schenck, *Palaeophyt.* 671; Sargent, *N. Am. Silva* IV, 83.

Living species: 75± described; 30-40 distinct; N. temperate regions to Japan, Himalayas, Mexico and Ecuador. Russia, 14; Europe, 14; Russian Europe, 9; N. America, 14-16; Canada, 8-9; S. Sts., 11-12; E. Sts., 10-11; Rocky mts., 4-5; Pl. King, 2; W. Tex., 4; mid. Calif., 2; Mexico, 3; Orient, 6; China and Japan, 3; Himalayas. 2.

Fossil species: Upper Cretaceous, Greenland (*Heer*), 2 sp.; Tertiary, Greenland (*Heer*), 4 sp.

Crataegus crus-galli LINN. Spec. 476 (1753).

C. lucida MILL. Dict. (1768).

Mespilus crus-galli MARSH. Arb. Am. 88 (1785).

M. lucida EHRH. Beitr. IV, 17 (1788).

Crataegus laurifolia MEDIC. Gesch. Bot. 84 (1793).

Mespilus cuneifolia MOENCH, Meth. 684 (1794).

Crataegus crus-galli var. *splendens* AIT. Hort. Kew. ed. 2, III, 202 (1811).

Mespilus watsoniana SPACH, Hist. Veg. II, 57 (1834).

Crataegus watsoniana ROEM. Syn. Monog. III, 117 (1847).

C. carrierei CARR. Rev. Hort. 108 (1883).

C. lavalleyi HORT. PAR.

Wats. and Coult., Gray's Man. 6 ed. 166; Britt., Fl. N. J. 100; Chap., Fl. S. St. 127; Upham, Fl. Minn. 53; Mac., Fl. Can. I, 147; Coult., Fl. Tex.

107; Cov., Fl. Ark. 180; Engl. Focke, Nat. Pflanz. 3, III, 26; Wats., Bibl. Ind. I, 277; Sarg., N. Am. Silva IV, 91.

North America: S. Ont. to N. Y., N. J. and Fla.; W. to Minn.?, Mo., Ark. and Colo. river, Tex.

Minn. valley: Reported from E. and S. E. districts; rare or doubtful; thickets and banks of streams.

HERB.: Sandberg 187, Red Wing.

Crataegus coccinea LINN. Spec. 476 (1753).

Mespilus coccinea MARSH. Arb. Am. 87 (1785).

Crataegus rotundifolia MOENCH, Baum. Weiss. 29, t. 1 (1785).

Mespilus rotundifolia EHRLH. Beitr. III, 20 (1788).

M. coccinea var. *viridis* CASTIGL. Viag. St. Uni. II, 293 (1790).

? *M. maxima* DU MONT DE COURS. Bot. Cult. ed. 2, V, 451 (1811).

? *Crataegus viridis* ELL. Sk. I, 551 (1821).

Mespilus odorata WENDL. Regensb. Flora 700 (1823).

? *M. wendlandii* OPIZ. Reg. Fl. 590 (1834).

M. flabellata SPACH, Suit. Buff. II, 63 (1834).

Crataegus coccinea var. *oligandra* TORR. and GRAY, Fl. I, 465 (1838).

C. coccinea var. *viridis* T. and G. Fl. I 465 (1838).

Halmia flabellata ROEM. Syn. Monog. III, 136 (1847).

Phaenopyrum coccineum and *wendlandii* ROEM. l. c. 156 (1847).

Anthomeles rotundifolia ROEM. l. c. 140 (1847).

Crataegus glandulosa var. *rotundifolia* REGEL, Act. Hort. Petrop. I, 120 (1871).

Wats. and Coult., Gray's Man. 6 ed. 165; Britt., Fl. N. J. 99; Coult., Fl. Colo. 89, in part; Chap., Fl. S. St. 127; Upham, Fl. Minn. 52; Mac., Fl. Can. I, 147, 522; II, 320; Cov., Fl. Ark. 180; Engl. Focke, Nat. Pflanz. 3, III, 26; Wats., Bibl. Ind. I, 276; Sarg., N. Am. Silva IV, 95.

North America: Newf., N. S., N. Br., Q., Ont. to Man. and Rocky mts.; S. to Mass., N. J., Fla. and Miss.; W. to Minn., Ark. and S. W. Colo.

Minn. valley: Higher levels; N. edge and far W.; rocky banks and hillsides.

HERB.: Sheldon 1497, Lake Benton; Bailey 449, Mud Lake; Kassube 82, Minneapolis.

Crataegus mollis SCHEELE, Linn. XXI. 569 (1847).

Mespilus coccinea SCHMIDT, Oestr. Baumz. IV, 30 (1822).

M. pubescens WENDLAND, Flora 700 (1823).

M. coccinea var. *pubescens* TAUSCH, Flora II, 718 (1838).

Crataegus coccinea var. *mollis* T. and G. Fl. I 465 (1838).

C. tomentosa EMERS. Trees Mass. 435 (1846).

Phaenopyrum subvillosum ROEM. Syn. Monog. III, 154 (1847).

Crataegus subvillosa TORR. Pac. R. R. Rep. IV, 86 (1856).

C. texana BUCKL. Proc. Ac. Phil. 454 (1861).

C. tomentosa var. *mollis* GRAY, Man. ed. 5, 160 (1868).

Mespilus tilaefolia KOCH, Dendr. I, 151 (1872).

Wats. and Coult., Gray's Man. 6 ed. 165; Upham, Fl. Minn. 53; Mac.,

Fl. Can. I, 147; Coult., Fl. Tex. 107; Wats., Bibl. Ind. I, 207; Sarg., N. Am. Silva IV, 99.

North America: Q., Ont. and L. Superior region; S. to Mass.; W. to Mich.; Minn., Mo., Tex. and Mexico.

Minn. valley: S. central district; habitat that of *C. coccinea*.

HERB.: *Taylor* 703, Minnesota lake; *Sheldon* 1231, Iberia, Brown Co.; *Sheldon* 358, Smith's Mills, Blue Earth Co.; *Taylor* 426, Janesville; *Taylor* 432, Lake Elysian, Waseca Co.; *Sheldon* 613, Wilton, Waseca Co.; *Herb. Wickersheim* 45, Mankato.

Crataegus tomentosa LINN. Spec. 476 (1753) *excl. syn. Gronov.*

C. leucophaeos MOENCH, Hort. Weiss. 31 (1785).

Mespilus calpodendron EHRH. Beitr. II, 67 (1788).

Crataegus pyrifolia AIT. Hort. Kew. II, 168 (1789).

Mespilus tomentosa CASTIGL. Viag. St. Uni. II, 293 (1790).

M. latifolia POIR. Enc. Meth. IV, 444 (1797).

Crataegus latifolia PERS. Syn. II, 37 (1807).

Mespilus pyrifolia WILLD. Enum. 523 (1809).

M. lobata POIR. Suppl. IV, 71 (1816).

Crataegus lobata BOSC. DC. Prodr. II, 628 (1825).

Halmia tomentosa and vars. *pyrifolia*, *leucophlaea* and *calpodendron*

ROEM. Syn. Monog. III, 135-136 (1847).

H. lobata ROEM. Syn. Monog. III, 136 (1847).

Crataegus tomentosa var. *pyrifolia* GRAY. Man. ed. 5, 160 (1868).

Wats. and Coult., Gray's Man. 6 ed. 166; Britt., Fl. N. J. 99; Chap., Fl. S. St. 127; Webb., Fl. Neb. 127; Upham, Fl. Minn. 52; Mac., Fl. Can. I, 147, 522; Wats., Bibl. Ind. I, 280; Sarg., N. Am. Silva IV, 101.

North America: Ont. and W. N. Y. to Man.; W. to Mich., Minn., Neb., Mo. and Tex.

Minn. valley: Throughout; common; thickets and wooded banks of streams.

HERB.: *Sheldon* 517, Waseca; *Sheldon* 1005, Sleepy Eye; *Kassube* 83, Minneapolis; *Holzinger* 72, Rush creek, Winona Co., *Bailey* 57, Vermilion lake; *Sandberg* 186, Red Wing; *Herb. Sheld.* 1765, Minneapolis; *Herb. Moyer* 79, Montevideo; *Herb. Wickersheim* 46, Idlewild; 47, Ash lake, Lincoln Co.

RUBUS LINN. Gen. 413 (1737).

Dalibarda LINN. Spec. 491 (1753).

Cylactis RAF. Sill. Journ. 377 (1819).

Baillon, *Hist. Pl.* I, 466; Benth. and Hook., *Gen. Pl.* I, 616; Durand, *Ind. Gen. Phan.* 113; Engler and Prantl, *Nat. Pflanz.* 3, III, 28; Schenck, *Palaeophyt.* 666.

Living species: 1500 described, 180-205 distinct. 100 (B. and H.). Cosmopolitan, especially in forests of N. hemisphere. Russia, 20; Europe, 56; Russian Europe, 10; North America, 24-25; Canada, 18-20; E. Sts., 11; S. Sts., 6; Rocky mts., 6; Pl. King, 3; Pl. Wheel., 4; Mid. Calif., 5.

Fossil species: Forest bed of Cromer, "Tuffen" Denmark. (*R. fruticosus* Linn. and *R. chamaemorus* Linn.).

Rubus repens (LINN.) OK. Rev. Gen. I, 223 (1891).

Dalibarda repens LINN. Spec. 491 (1753).

Rubus dalibarda LINN. Spec. 2 ed. 708 (1762).

Dalibarda violacoides MICHX. Fl. N. Am. I, 299 (1803).

Wats. and Coult., Gray's Man. 6 ed. 156; Upham, Fl. Minn. 57; Mac., Fl. Can. I, 129, 514; Engl. Focke, Nat. Pflanz. 3, III, 28; Wats., Bibl. Ind. I, 315.

North America: N. S., N. Br., Q., Ont. to L. Huron reg.; S. to Minn., Wisc. and Mich.—N. peninsular.

Minn valley: Reported from the N. edge; wooded hillsides and dark, shaded brooks; rare.

Rubus hispidus LINN. Spec. 493 (1753).

R. obovalis MICHX. Fl. N. Am. I, 298 (1803).

R. obovatus ELL. Sk. I, 570 (1824).

Wats. and Coult., Gray's Man. 6 ed. 155; Britt., Fl. N. J. 94; Upham, Fl. Minn. 52; Chap., Fl. S. St. 125; Mac., Fl. Can. I, 131; Cov., Fl. Ark. 179; Wats., Bibl. Ind. I, 315.

North America: N. S., N. Br., Q., Ont. to N. Eng., N. J., Ga.; W. to Minn., E. Kan. and Ark.

Minn. valley: N. E. district and N. edge; rare; woods and thickets; edges of streams.

HERB.: *Bailey* 182, Vermilion lake; *Sandberg* 183, Chisago Co.

Rubus canadensis LINN. Spec. 494 (1753).

R. arcticus WALT. Fl. Car. 149 (1788).

R. flagellaris WILLD. Enum. 594 (1809).

R. procumbens MUHL. Cat. 52 (1813).

R. trivialis PURSH, Fl. Am. 347 (1814).

Wats. and Coult., Gray's Man. 6 ed. 155; Britt., Fl. N. J. 94; Upham, Fl. Minn. 52; Mac., Fl. Can. I, 131; Cov., Fl. Ark. 179; Wats., Bibl. Ind. I, 314.

North America: Newf., N. S., N. Br., Q., Ont. to Man.; S. to N. Eng. and N. J.; W. to Minn., Kan. and Ark.

Minn. valley: Forest district to Blue Earth Co.; probably to Cottonwood valley; hillsides and barren places.

HERB.: *Taylor* 18, Elysian; *Taylor* 201, Janesville; *Sheldon* 451, Madison Lake; *Ballard* 234, Jordan, Scott Co.; *Kassube* 80, Minneapolis; *Holzinger* 70, Winona Co.; *Sandberg* 182, Vasa; *Herb. Wickersheim* 43, Mankato.

Rubus villosus AIT. Hort. Kew. II, 210 (1789).*R. fruticosus* MARSH. Arbust. 137 (1785).*R. argutus* LINK, Enum. II, 60 (1822).

Wats. and Coult., Gray's Man. 6 ed. 155; Britt., Fl. N. J. 94, Webb., Fl. Neb. 128; Chap., Fl. S. St. 125; Upham, Fl. Minn. 52; Mac., Fl. Can. I, 131, 514; Cov., Fl. Ark. 179; Engl. Focke, Nat. Pflanz. III, 3, 31; Wats., Bibl. Ind. I, 316.

North America: Newf. and N. S. to Man.; N. U. S. to Ga. and Ark.

Minn. valley: Throughout; local or rare; edges of thickets and openings in forest.

HERB.: *Sheldon* 147, Madison Lake; *Ballard* 446, Prior's lake, Scott Co.; *Ballard* 81, Chaska; *Sandberg* 180, Goodhue Co.; *Holzinger* 68, Dakota Co.; *Kassube* 79, Minneapolis; *Oestlund* 53, Ramsey Co.; ? *Holzinger* 69, Rush creek valley; *Sandberg* 181, Cannon Falls; *Herb. Sheld.* 1784, Minneapolis; *Herb. Wickersheim* 42, Idlewild, Lincoln Co.

Rubus occidentalis LINN. Spec. 493 (1753).*R. idaeus* var. *americanus* TORR. Ann. Lyc. N. Y. II, 106 (1835).

Wats. and Coult., Gray's Man. 6 ed. 155; Webb., Fl. Neb. 128; Upham, Fl. Minn. 51; Coult., Fl. Colo. 80; Chap., Fl. S. St. 125; Britt., Fl. N. J. 94; Mac., Fl. Can. I, 130; Engl. Focke, Nat. Pflanz. III, 3, 30; Wats., Bibl. Ind. I, 316.

North America: N. Br., Q., Ont. to N. Eng.; N. J. and Ga.; W. to Minn., Neb., Colo. and Oregon; N. in Brit. Col.

Minn. valley: Forest and prairie districts. W. to Pommedes Terres valley; waste grounds and barren woodland.

HERB.: *Ballard* 469, Prior's lake, Scott Co.; *Kassube* 78, Minneapolis; *Oestlund* 52, Hennepin Co.; *Sandberg* 179, Cannon Falls; *Herb. Moyer* 77, Montevideo.

Rubus strigosus MICHX. Fl. N. Am. I, 297 (1803).*R. idaeus* PURSH, Fl. Am. 346 (1814).

R. idaeus var. *strigosus* MAXIM. Bull. Acad. Petersb. XVII, 161 (1875).

Wats. and Coult., Gray's Man. 6 ed. 155; Webb., Fl. Neb. 128; Britt., Fl. N. J. 93; Upham, Fl. Minn. 51; Coult., Fl. Colo. 79; Mac., Fl. Can. I, 130, 514; Trautv., Fl. Sib. 53?; Hook., Fl. Gt. Brit. 117; Miyabe, Fl. Kur. 228; Wats., King Exp. 82, 420; Roth., Wheel. Exp. 111; Engl. Focke, Nat. Pflanz. III, 3, 30; Wats., Bibl. Ind. I, 318

N. and W. Europe?, Siberia to Japan, Saghalin and Kurile Isles; N. Africa?.

North America: Labrador to Man. and Coast range; S. to N. J. and N. Car.; W. to Minn., Neb., Mo., Colo. and N. Mex.

Minn. valley: Throughout; particularly in the forest region; wooded hillsides and banks of streams.

HERB.: *Ballard* 207, Jordan, Scott Co.; *Sheldon* 854, Sleepy Eye; *Sheldon* 43, Elysian; *Taylor* 133, Janesville; *Bailey* 170, Vermilion lake; *Holzinger* 67, Winona Co.; *Herrick* 101, Minneapolis; *Kassube* 77, Minneapolis; *Sandberg* 178, Cannon Falls; *Herb. Sheld.* 1852, Minneapolis; *Herb. Wickersheim* 40, Lake Park, Becker Co.; 41, Idlewild, Lincoln Co.

Rubus triflorus RICH. Frankl. Journ. 2 ed. 19 (1825).

R. saxatilis var. *canadensis* MICHX. Fl. N. Am. I, 298 (1803).

R. saxatilis var. *americanus* PERS. Syn. II, 52 (1807).

Cylactis montana RAF. Ann. Journ. Sci. 1, I, 377 (1820).

Rubus saxatilis BIGEL. Fl. Bost. 2 ed. 201 (1824).

R. canadensis TORR. Fl. U. S. 488 (1824).

R. aegopodioides SERINGE, DC. Prodr. II, 565 (1825).

R. mucronatus SERINGE, DC. Prodr. II, 565 (1825).

Wats. and Coult., Gray's Man. 6 ed. 154; Britt., Fl. N. J. 93; Upham, Fl. Minn. 51; Mac., Fl. Can. I, 129; Engl. Focke, Nat. Pflanz. III, 3, 29; Wats., Bibl. Ind. I, 318.

North America: Labrador to Hudson Bay and Pac. in Can.; S. to N. J.; W. to Minn., Iowa, Dak. and Mont.

Minn. valley: Forest district, Ft. Snelling to Blue Earth Co. and New Ulm; wooded banks and hillsides.

HERB.: *Kassube* 76, Minneapolis; *Holzinger* 66, Winona Co.; *Sandberg* 177, Goodhue Co.

FRAGARIA LINN. Gen. 414 (1737).

Duchesnia SMITH, Trans. Linn. Soc. X, 372 (1819).

Baillon, *Hist. Pl.* I, 465; Benth. and Hook., *Gen. Pl.* I, 633; Durand, *Ind. Gen. Phan.* 113; Engler and Prantl, *Nat. Pflanz.* 3, III, 33; Schenck, *Palaeophyt.* 666.

Living species: 10; north temperate regions to S. India and Mexico; 1 sp. in Chile. 6 sp. (Durand); 3-4 (B. and H.). Russia, 4; Europe, 4; Russian Europe, 4; North America, 4; Mid. Calif., 4; E. Sts., 2; Canada, 3; S. Sts., 1; Rocky mts., 2; Pl. King, 1; Pl. Wheel., 1.

Fossil species: 3-4; Miocene, Hungary (*Stur*); Spitzbergen and Cape Lyall (*Heer*).

Fragaria vesca LINN. Spec. 494 (1753).

Wats. and Coult., Gray's Man. 6 ed. 158; Britt., Fl. N. J. 95; Webb., Fl. Neb. 128; Upham, Fl. Minn. 51; Coult., Fl. Colo. 83; Brew. and Wats., Fl. Calif. I, 177; Hook., Fl. Gt. Brit. 123; Mac., Fl. Can. I, 135; Led., Fl. Ross. II, 63; Nym., Fl. Eur.; Herd, Fl. Eur. Russ. 48; Greene, Fl. Fran. 70; Wats., King Exp. 85; Engl. Focke, Nat. Pflanz. III, 3, 33; Wats., Bibl. Ind. I, 282; Hart., Fl. Scand. I, 285.

Arctic Europe; N. and W. Asia to Himalayas,

North America: Canada throughout to lat. 56° N. on

Peace river and middle elevations in Sierras; throughout N. U. S. to Arizona and Virginia.

Minn. valley: Throughout; forest region and wooded banks of streams; less abundant than *F. virginiana* var. *illinoensis* (Prince).

HERB.: *Sheldon* 853, Sleepy Eye; *Ballard* 137, Chaska; *Kassube* 75, Minneapolis; *Oestlund* 51, Hennepin Co.; *Bailey* 45, Vermilion lake; *Hammond* 53, Lake City; *Herb. Sheld.* 1858, Hennepin Co.

***Fragaria virginiana* MILL. var. *illinoensis* (PRINCE) GRAY,** Man. V, 158 (1867).

F. elatior EAT. Man. 249 (1818) not Ehrh.

F. illinoensis and *iowensis* PRINCE, Treat. Gard. Flush. (1820).

F. grayana VILM. ex Gay, Ann. Sci. Nat. Ser. 4, VIII, 202 (1857).

Wats. and Coult., Gray's Man. 6 ed. 158; Britt., Fl. N. J. 95; Webb., Fl. Neb. 128; Coult., Fl. Colo. 83; Upham, Fl. Minn. 51; Brew. and Wats., Fl. Calif. I, 177; Mac., Fl. Can. I, 135; II, 319; Engl. Focke, Nat. Pflanz. III, 3, 33 (spec.); Wats., Bibl. Ind. I, 283.

North America: Ont. to Brit. Col., Coast range and 64° N. lat. in mts.; W. N. Y. to Minn., Mont., Washington and S. E. of Rockies to Colo., Neb., Kan. and Arizona?.

Minn. valley: Throughout; common in rich soil and on shaded banks of streams.

HERB.: *Ballard* 175, Shakopee; *Taylor* 165, Janesville; *Sheldon* 37, Elysian; *Ballard* 144, Chaska; *Bailey* 36, Vermilion lake; *Kassube* 74, Minneapolis; *Sandberg* 175, Red Wing; *Oestlund* 50, Hennepin Co.; *Sandberg* 176, Tower; *Herb. Moyer* 76, Montevideo; *Herb. Wickersheim* 39, Ash lake, Lincoln Co.; *Herb. Sheld.* 1859, Minneapolis.

POTENTILLA LINN. Gen. 415 (1737).

Comarum LINN. Gen. 417 (1737).

Tormentilla LINN. Gen. 416 (1737).

Sibbaldia LINN. Syst. VI, 310 (1748).

Trichothalamus LEHM. Act. Caes. X, 585 (1834?).

Lehmannia TRATT. Ros. Monog. IV, 144 (1824).

Bootia BIGEL. Fl. Bost. ed. II, 351 (1824).

Dryadanthe ENDL. Gen. 1242 (1840).

Dactylophyllum SPENN. Fl. Frib. III, 1034 (1829).

Horkelia CHAM. and SCHL. Linn. II, 26 (1828).

Ivesia TORR. Bot. U. S. Expl. Exp. II, 4 (1855).

Quinquefolium and **Pentaphylloides** TOURN. Inst. 296 (1700).

Fragariastrum SCHUR. Enum. Transsylv. 137 (1866).

Chamaerhodos BUNGE, Led. Fl. Alt. I, 429 (1829).

Potaninia MAX. Mel. Biol. XI, 214 (1881).

Baillon, *Hist. Pl.* I, 466; Benth. and Hook., *Gen. Pl.* I, 620; Durand, *Ind. Gen. Phan.* 113; Engler and Prantl, *Nat. Pflanz.* 3, III, 34, 35, 36 (Focke); Schenck, *Palaeophyt.* 666.

Living species: 300± described; 165 distinct. Boreal and temperate regions of N. hemisphere, tropical mts. and 2 sp. in S. hemisphere. Russia, 70; Europe, 67; Russian Europe, 43; North America, 52-56; California, 35; E. Sts., 14-15; Canada, 30-33; Rocky mts., 16-20; Pl. King, 15; Pl. Wheel., 14; S. Sts., 3.

Fossil species: Arctic regions, Tertiary (*Heer*) *Dryas*?

Potentilla canadensis LINN. Spec. 498 (1753).

P. pumila POIR. Enc. Meth. V, 594 (1804).

P. sarmentosa WILLD. Enum. 554 (1809).

Wats. and Coult., Gray's Man. 6 ed. 160; Britt., Fl. N. J. 96; Upham, Fl. Minn. 49; Chap., Fl. S. St. 124; Mac., Fl. Can. I, 141, 518; Cov., Fl. Ark. 179; Wats., Bibl. Ind. I, 294.

North America: N. S., Q., Ont. to L. Huron; S. to N. Eng., N. J., N. Car. and Miss.; W. to Minn., Neb., Kan. and Ark.

Minn. valley: Throughout; in dry or sandy soil; especially in forest openings.

HERB.: *Ballard* 252, Jordan, Scott Co.; *Taylor* 930, Glenwood; *Taylor* 570, Minnesota lake; *Taylor* 797, Glenwood; *Ballard* 416, New Prague, Scott Co.; *Oestlund* 42, Hennepin Co.; *Kassube* 70, Minneapolis; *Oestlund* 43, Hennepin Co.; *Herrick* 94, Minneapolis; *Herrick* 95, Minneapolis; *Sandberg* 169, Cannon Falls.

Potentilla canadensis LINN. var. **simplex** (MICHX.) T. and G. Fl. I, 443 (1838).

P. simplex MICHX. Fl. N. Am. I, 303 (1803).

P. caroliniana POIR. Enc. Meth. V, 595 (1804).

Wats. and Coult., Gray's Man. 6 ed. 160; Britt., Fl. N. J. 96; Webb., Fl. Neb. 128; Upham, Fl. Minn. 49; Chap., Fl. S. St. 124; Mac., Fl. Can. I, 141, 518; Wats., Bibl. Ind. I, 294.

North America: With type; more common eastward.

Minn. valley: Forest district; N. E. and reported to New Ulm; meadows and damp places along streams.

HERB.: *Sandberg* 170, Chisago Co.; *Manning* 3, Lake City.

Potentilla anserina LINN. Spec. 495 (1753).

Wats. and Coult., Gray's Man. 6 ed. 160; Britt., Fl. N. J. 96; Upham, Fl. Minn. 50; Coult., Fl. Colo. 86; Trautv., Fl. Sib. 50; Hook., Fl. Gt. Brit. 125; Brew. and Wats., Fl. Calif. I, 180; Mac., Fl. Can. I, 141; Forbes and Hems., Fl. Sin. 240; Led., Fl. Ross, II, 44; Nym., Fl. Eur.; Miyabe, Fl. Kur. 232; Herd., Fl. Eur. Russ. 48; Greene, Fl. Fran. 63; Wats., King

Exp. 89; Roth., Wheel. Exp. 114; Engl. Focke, Nat. Pflanz. III, 3, 34; Wats., Bibl. Ind. I, 293; Hart, Fl. Scan. I, 287; Webb., Appx. Neb. 34; Rothr., Alask. 445.

Arctic Europe; N. Asia to Himalayas and China; Australasia and S. America.

North America: Greenland; E. Canada to Arctic ocean; S. to N. Eng., N. J.; W. to Minn., Neb.; California to N. Mexico.

Minn. valley: N. E. districts; N. edge and high levels, W. and S. W.; river banks and hillsides.

HERB.: *Sheldon* 1492, Pipestone City; *Sheldon* 1556, Lake Benton; *Sheldon* 1360, Verdi, Lincoln Co.; *Kassube* 73, Minneapolis; *Oestlund* 46, Minneapolis; *Herrick* 97, Minneapolis; *Oestlund* 47, Hennepin Co.; *Sandberg* 172, Red Wing; *Herb. Sheld.* 1763, Minneapolis; *Herb. Wickershiem*, Ash Lake, Lincoln Co.; *Herb. Moyer* 75, Montevideo.

Potentilla tridentata SOLAND. Ait. Kew. II, 216 (1789).

P. retusa MUELL. Fl. Dan. V, 799 (1782).

Wats. and Coult., Gray's Man. 6 ed. 160; Britt., Fl. N. J. 97; Upham, Fl. Minn. 51; Chap., Fl. S. St. 124; Mac., Fl. Can. I, 141; Wats., Bibl. Ind. I, 301.

North America: Labrador and Greenland; Newf., N. S., N. Br., L. Huron reg., L. Superior to Rocky mts. and 64° N. lat in N. W. T.; S. to N. Eng., N. J. and mts. of N. Car.; W. around Gt. lakes to N. Iowa, Wisc. and Minn.

Minn. valley: Far N. W. and N. edge; only in forest district; high ground and exposed places.

HERB.: *Roberts* 33, Grand Marais; *Roberts* 34, Duluth; *Bailey* 425, Fall lake; *Herrick* 98, Northern Pacific Junction; *Sandberg* 173, N. P. Junction; *Bailey* 513, Agate bay.

Potentilla fruticosa LINN. Spec. 494 (1753).

P. fruticosa var. *americana* MARSH. Arbust. Amer. 109 (1785).

P. floribunda PURSH, Fl. Am. 355 (1814).

Dasyphora floribunda RAF. Aut. Bot. 167 (1838).

Wats. and Coult., Gray's Man. 6 ed. 160; Britt., Fl. N. J. 96; Upham, Fl. Minn. 50; Coult., Fl. Colo. 86; Brew. and Wats., Fl. Calif. I, 180; Trautv., Fl. Sib. 52; Hook., Fl. Gt. Brit. 123; Mac., Fl. Can. I, 141; Forbes and Hems., Fl. Sin. 243; Led., Fl. Ross. II, 61; Nym., Fl. Eur.; Miyabe, Fl. Kur. 230; Herd., Fl. Eur. Russ. 46; Greene, Fl. Fran. 63; Wats., King Exp. 89; Roth., Wheel. Exp. 114; Engl. Focke, Nat. Pflanz. III, 3, 34; Wats., Bibl. Ind. I, 296; Hart., Fl. Scand. I, 287; Rothr., Alask. 445.

N. Europe to Alps and Pyrenees; N. and W. Asia to Himalayas; China and Japan; Kurile isls.

North America: Greenland, Labrador and Newf. to Man. and Arctic circle; S. to N. J.; W. to Iowa, Minn., Colo., N. Calif. and S. in mts. to C. Arizona. Alaska.

Minn. valley: Higher levels, far N. W.; wet grounds and edges of sloughs.

HERB.: *Bailey* 495, Agate bay; *Roberts* 31, Grand Marais; *Roberts* 32, Split Rock.

Potentilla palustris (LINN.) SCOP. Fl. Carn. 2 ed. I, 359 (1772).

Comarum palustre LINN. Spec. 502 (1753).

Fragaria palustris CRANTZ, Stirp. Austr. 73 (1769).

Comarum digitatum and *angustifolium* RAF. Fl. Tell. II, 55, 56 (1838).

Wats. and Coult., Gray's Man. 6 ed. 160; Upham, Fl. Minn. 51; Brew. and Wats., Fl. Calif. I, 180; Hook., Fl. Britt. 124; Trautv., Fl. Sib. 53; Britt., Fl. N. J. 97; Mac., Fl. Can. I, 140; Led., Fl. Ross. II, 61; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 48; Greene, Fl. Fran. 63; Engl. Focke, Nat. Pflanz. III, 3, 34; Wats., Bibl. Ind. I, 299; Hart., Fl. Scand. I, 286; Rothr., Alask. 445.

Arctic Europe to Pyrenees; Russia to Caucasus; N. Asia.

North America: Labrador and N. S. to Hudson Bay, Puget sound and Alaska; S. to N. J., Ind., Mich., Wisc., Ill., Minn.; on Pac. coast to C. California.

Minn. valley: Throughout; bogs and edges of marshes; rather common.

HERB.: *Taylor* 1200, Lake Helena, Waseca Co.; *Sheldon* 710, Sleepy Eye; *Sheldon* 123, Madison Lake; *Ballard* 443, Prior's lake, Scott Co.; *Ballard* 415, New Prague, Scott Co.; *Sheldon* 345, Smith's Mill, Blue Earth Co.; *Sheldon* 428, Ash lake, Blue Earth Co.; *Sheldon* 522, Waseca; *Ballard* 356, Helena, Scott Co.; *Herrick* 99, Minneapolis; *Oestlund* 48, Ramsey Co.; *Herrick* 100, Minneapolis; *Oestlund* 49, Ramsey Co.; *Bailey* 142, Vermilion lake; *Sandberg* 174, Chisago Co.

Potentilla argentea LINN. Spec. 497 (1753).

Wats. and Coult., Gray's Man. 6 ed. 160; Britt., Fl. N. J. 96; Upham, Fl. Minn. 50; Hook., Fl. Brit. 123; Mac., Fl. Can. I, 139; Led., Fl. Ross. II, 47; Nym., Fl. Eur.; Mac., Fl. Can. I, 517; Herd., Fl. Eur. Russ. 48; Engl. Focke, Nat. Pflanz. III, 3, 35; Wats., Bibl. Ind. I, 293; Hart, Fl. Scand. I, 288

Europe; N. and W. Asia.

North America: N. S., N. Br., Q., Ont. to N. J.; W. to Dak. and E. Kan.

Minn. valley: N. E. district and E. edge; infrequent; dry fields and hillsides.

HERB.: *Herrick* 96, Minneapolis; *Oestlund* 44, Minneapolis; *Kassube* 71, Minneapolis; *Herb. Sheld.* 1764, Minneapolis.

Potentilla hippiana LEHM. Nov. Stirp. Pug. II, 7 (1830),*P. leucophylla* TORR. Ann. Lyc. N. Y. II, 197, (1835).*P. pensylvanica* var. *hippiana* T. and G. Fl. I, 438 (1838).

Wats. and Coult., Gray's Man. 6 ed. 159; Coult., Fl. Colo. 81; Webb., Fl. Neb. 128; Upham, Fl. Minn. 50; Mac., Fl. Can. I, 137; Roth., Wheel. Exp. 112; Wats., Bibl. Ind. I, 297.

North America: Saskatchewan to Rockies and Brit. Col.; N. to 50° N. lat.; S. to Colo., Minn.; Neb., N. Mex. and Arizona.

Minn. valley: Reported from Leaf hill district; doubtful; plains and sunny hillsides.

Potentilla pensylvanica LINN. Mant. 76 (1767).*P. bipinnatifida* DOUGL. Hook. Fl. Bor.-Am. I, 188 (1832).*P. pensylvanica* var. *bipinnatifida* T. and G. Fl. I, 438 (1838).

Wats. and Coult., Gray's Man. 6 ed. 159; Webb., Fl. Neb. 128; Upham, Fl. Minn. 50; Coult., Fl. Colo. 81; Forbes and Hems., Fl. Sin. 243; Led., Fl. Ross. II, 40; Nym., Fl. Eur.; Mac., Fl. Can. I, 516; Herd., Fl. Eur. Russ. 46; Roth., Wheel. Exp. 112; Wats., King Exp. 86, 87; Engl. Focke, Nat. Pflanz. III, 3, 34; Wats., Bibl. Ind. I, 300; Rothr., Alask. 445.

Ural and Baikal Siberia; Caucasus mts. to Japan.

North America: Labrador and Anticosti to Q., Ont., Hudson Bay, Man., Saskatchewan, Rocky mts. and N. W. T.; S. to Maine and N. H.; W. to Minn., Dak., Colo., N. Mex.

Minn. valley: Reported from S. and S. W. edge; doubtful; meadows and edges of woods.

Potentilla pensylvanica LINN. var. **strigosa** PURSH, Fl. Am. 356 (1814).

Wats. and Coult., Gray's Man. 6 ed. 159; Upham, Fl. Minn. 50; Coult., Fl. Colo. 81; Webb., Fl. Neb. 128?; Mac., Fl. Can. I, 136, 517; Wats. Bibl. Ind. I, 300.

North America: Brit. Col. and Rockies to Mont., Minn., Colo. and Neb?.

Minn. valley: Throughout; infrequent; more abundant W. than E.; dry or rocky knolls.

HERB.: *Sheldon* 442, Pipestone; *Taylor* 875, Glenwood; *MacM. and Sheld.* 1, Brainerd.

Potentilla supina LINN. Spec. 497 (1753).*P. paradoxa* NUTT. T. and G. Fl. I, 437 (1838).

Wats. and Coult., Gray's Man. 6 ed. 159; Coult., Fl. Colo. 84; Upham, Fl. Minn. 49; Trautv., Fl. Sib. 50; Mac., Fl. Can. I, 136; Forbes and Hems., Fl. Sin. 245; Led., Fl. Russ. II, 35; Nym., Fl. Eur.; Mac., Fl. Can. I, 516; Herd., Fl. Eur. Russ. 46; Coult., Fl. Tex. 106; Engl. Focke, Nat. Pflanz. III, 3, 34; Wats., Bibl. Ind. I, 301; Webb., Appx. Neb. 34.

Europe; N. Asia and China; S. America.

North America: Ont. to Man. and Gt. lake reg.; S. to

Minn., Mo., N. Mex. and Rio Grande; E. to Miss. river and Ohio.

Minn. valley: Throughout; infrequent; sandy shores of lakes and dry places.

HERB.: *Ballard* 452, Prior's lake, Scott Co.; *Herrick* 93, Minnetonka; *Holzinger* 65, Winona Co.; *Herb. Wickersheim* 37, Idlewild, Lincoln Co.

Potentilla millegrana ENGELM. Lehm. Ind. Sem. Hamb. (1849).

P. rivalis var. *millegrana* WATS. Rev. Pot. 553 (1871).

Wats. and Coult., Gray's Man. 6 ed. 159; Webb., Fl. Neb. 128; Coult., Fl. Colo. 178; Mac., Fl. Can. 136, 516; Greene, Fl. Fran. 65; Wats., King Exp. 85; Roth., Wheel. Exp. 112; Wats., Bibl. Ind. I, 301.

North America: Red and Saskatchewan valleys to Rocky mts.; along E. slope of Sierra Nevada to N. Mex.; S. in prairie reg. to Minn., Dak. and Neb.

Minn. valley: Far W. and N. W. on higher levels; prairies; no Minn. specimens seen.

Potentilla norvegica LINN. Spec. 449 (1753).

? *P. labradorica* LEHM. Ind. Sem. Hamb. (1849).

Wats. and Coult., Gray's Man. 6 ed. 159; Britt., Fl. N. J. 96; Upham, Fl. Minn. 49; Coult., Fl. Colo. 83; Webb., Fl. Neb. 128; Chap., Fl. S. St. 124; Hook., Fl. Gt. Brit. 126; Mac., Fl. Can. I, 136, 516; Led., Fl. Ross. II, 36; Nym., Fl. Eur.; Herd., Fl. Eur. Russ., 46; Wats., King Exp. 85; Engl. Focke, Nat. Pflanz. III, 3, 34; Wats., Bibl. Ind. I, 299; Hart., Fl. Scand. I, 289; Rothr., Alask. 445.

Mid. and N. Europe and N. Asia.

North America: N. S. and Labrador? to N. J.; W. to Minn., Dak., Mont., Colo., Neb. and Mo?.

Minn. valley: Throughout; in fields and along roads or railway embankments.

HERB.: *Taylor* 930, Glenwood; *Taylor* 570, Minnesota lake; *Taylor* 797, Glenwood; *Ballard* 416, New Prague, Scott Co.; *Ballard* 663, Waconia; *Ballard* 238, Jordan, Scott Co.; *Sheldon* 343, Lake Madison; *Sheldon* 759, Sleepy Eye; *Sheldon* 211, Lake Washington, Blue Earth Co.; *Sheldon* 1123, Springfield; *Sheldon* 518, Waseca; *Ballard* 451, Prior's lake, Scott Co., *Herrick* 91, Minneapolis; *Roberts* 30, Grand Marais; *Oestlund* 41, Minneapolis; *Arthur* 9, Vermilion lake; *Bailey* 496, Agate bay; *Sandberg* 168, Red Wing; *Herrick* 92, Minneapolis; *Kasube* 69, Minneapolis; *Herb. Moyer* 73, Montevideo.

Potentilla arguta PURSH. Fl. Am. 636 (1814).

Boottia sylvestris BIGEL. Fl. Bost. ed. 2, 206 (1824).

Potentilla confertiflora TORR. Fl. U. S. I. 499 (1824).

P. pensylvanica var. *arguta* TORR. Ann. Lyc. N. Y. II, 197 (1835).

Wats. and Coult., Gray's Man. 6 ed. 158; Britt., Fl. N. J. 96; Webb., Fl. Neb. 128; Upham, Fl. Minn. 50; Coult., Fl. Colo. 83; Mac., Fl. Can. I, 136, 516; Wats., King Exp. 89; Wats., Bibl. Ind. I, 293.

North America: N. Br., Q., Ont. to Brit. Col.; N. to lat. 65°; S. to N. J.; W. to Minn., Kan., Neb., Colo., New Mexico and Idaho.

Minn. valley: Throughout; knolls, high plains and headlands.

HERB.: *Sheldon* 1315, Lake Benton; *Ballard* 570, Prior's lake, Scott Co.; *Ballard* 381, Jordan, Scott Co.; *Ballard* 188, Jordan, Scott Co.; *Sheldon* 608, Wilton, Waseca Co.; *Sheldon* 786, Sleepy Eye; *MacMillan* 13, Glenwood; *Taylor* 850, Glenwood; *Leonard* 15, Minnehaha park; *Leonard* 16, Spring Valley; *Oestlund* 45, Minneapolis; *Bailey* 412, Agate bay; *Kasube* 72, Minneapolis; *Sandberg* 171, Cannon Falls; *Herb. Sheld* 1751, Minneapolis; *Herb. Moyer* 74, Chippewa Co.

GEUM LINN. Gen. 418 (1737).

Caryophyllata TOURN. Inst. 294 (1700).

Sieversia WILLD. Berl. Mag. V, 39 1804).

Buchavea REICH. Consp. 167 (1828).

Adamsia F. and ENDL. Gen. 6384 (1840).

Oreogeum SERINGE, DC. Prodr. II, 553 (1825).

Stylipus RAF. Neog. 3 (1825).

Waldsteinia WILLD. N. Act. Ber. II, 105 (1802).

Comaropsis L. C. RICH. Nestl. Pot. 16 (1816).

Coluria R. BR. Parr. Voy. Appx. 276 (1823).

Laxmannia F. and M. Led. Fl. Alt. II, 262 (1830).

Baillon, *Hist. Pl.* I, 466; Benth. and Hook., *Gen. Pl.* I, 619; Engler and Prantl, *Nat. Pflanz.* 3, III, 36; (Focke); Durand, *Ind. Gen. Phan.* 113.

Living species: 44±; temperate and arctic regions of N. hemisphere; a few in S. temperate regions. Russia, 10; Europe, 12; Russian Europe, 6; North America, 16–20; Mid. Calif., 2; Canada, 13; S. Sts., 4; E. Sts., 10; Pl. Wheel., 4.

Geum ciliatum PURSH, Fl. Am. 352 (1814).

G. triflorum PURSH, Fl. Am. 736 (1814).

Sieversia triflorum R. BR. Parr. 1st Voy. 276 (1824).

Geum pubescens HOOK. Fl. Bor.-Am. I, 175 (1833).

Wats. and Coult., Gray's Man. 6 ed. 157; Coult., Fl. Colo. 82; Brew. and Wats., Fl. Calif. I, 176; Upham, Fl. Minn. 49; Mac., Fl. Can. I, 134; Greene, Fl. Fran. 62; Roth., Wheel. Exp. 112; Wats., King Exp. 84; Wats., Bibl. Ind. I, 285.

North America: Labrador and Ont. to Brit. Col.; S. to N. N. Eng.; W. to Minn., Mo., Colo.; N. to Alaska and arctic circle; S. in Sierras to Calif.

Minn. valley: Throughout; dry land or high, sunny hillsides, and on bluffs and headlands.

HERB.: *Ballard* 186, Jordan, Scott Co.; *Taylor* 793, Glenwood; *Wickersheim* 2, Idlewild, Lincoln Co.; *Oestlund* 40, Ramsey Co.; *Kassube* 68, Minneapolis; *Sandberg* 166, Goodhue Co.; *Sandberg* 167, Cannon Falls; *Hammond* 15, Lake City; *Herb. Sheld.* 1854, Minneapolis; *Herb. Wickersheim* 36, Idlewild; Lincoln Co.; *Herb. Moyer* 72, Carlton lake, Montevideo.

***Geum rivale* LINN.** Spec. 501 (1753).

Wats. and Coult., Gray's Man. 6 ed. 157; Britt., Fl. N. J. 95; Coult., Fl. Colo. 82; Upham, Fl. Minn. 49; Hook., Fl. Gt. Brit. 122; Mac., Fl. Can. I, 133, 515; Led., Fl. Ross. II, 23; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 46; Roth., Wheel. Exp. 112; Engl. Focke, Nat. Pflanz. III, 3, 37; Wats., Bibl. Ind. I, 284; Hart., Fl. Scand. I, 291.

Europe; N. and W. Asia and Australasia to S. America.

North America: Labrador, Newf., N. S., N. Br. to Q., Ont., Man. and Brit. Col.; S. to N. J.; W. to Minn., Dak., Mont., Colo. and Mo.

Minn. valley: Reported from Nicollet Co., doubtful; more certainly in vicinity of Ft. Snelling; wet fields and springs.

HERB.: *Bailey* 350, Mud river.

***Geum strictum* AIT.** Hort. Kew. II, 217 (1789).

G. canadense MURR. Com. Goett. V, 34 (1790) not Jacq.

G. ranunculoides SERINGE, DC. Prodr. II, 551 (1825).

Wats. and Coult., Gray's Man. 6 ed. 157; Britt., Fl. N. J. 94; Upham, Fl. Minn. 49; Coult., Fl. Colo. 82; Webb., Fl. Neb. 128; Mac., Fl. Can. I, 133; Forbes and Hems., Fl. Sin. 269; Led., Fl. Ross. II, 23; Nym., Fl. Eur.; Miyabe, Fl. Kur. 229; Herd., Fl. Eur. Russ. 46; Engl. Focke, Nat. Pflanzen. III, 3, 37; Wats., Bibl. Ind. I, 285.

Mid. Russia; Siberia, China and Kamtk.; Kurile Isls.; New Zealand; Japan; Corea; S. America.

North America: N. S. to Coast range in Brit. Col.; Newf. to N. Eng., N. J.; W. to Minn., Dak., Neb., Kan., Colo. and Arizona

Minn. valley: Throughout; damp edges of woods and in meadows.

HERB.: *Ballard* 492, Prior's lake, Scott Co.; *Taylor* 674, Minnesota lake; *Sheldon* 997, Sleepy Eye; *Sheldon* 1182, New Ulm; *Taylor* 547, Janesville; *Ballard* 369, Helena, Scott Co.; *Sheldon* 691, Waseca; *Ballard* 225, Jordan, Scott Co.; *Taylor* 797, Glenwood; *Sheldon* 1301, Lake Benton; *Herrick* 89, Minneapolis; *Roberts* 28, Duluth; *Roberts* 29, Grand Marais; *Kassube* 67, Minneapolis; *Herrick* 90, Minneapolis; *Sandberg* 165, Cannon Falls; *Herb. Sheld.* 1696, Minneapolis.

Geum japonicum THUNB. Fl. Jap. 220 (1784).*G. macrophyllum* WILLD. Enum. I, 557 (1809).*G. strictum* var *B.* HOOK. Fl. Bor.-Amer. I, 175 (1833).

Wats. and Coult., Gray's Man. 6 ed. 156; Upham, Fl. Minn. 49; Coult., Fl. Colo. 82; Brew. and Wats., Fl. Calif. I, 176; Mac., Fl. Can. I, 133, 515; Miyabe, Fl. Kur. 230; Led., Fl. Ross. II, 23; Greene, Fl. Fran. 61; Roth., Wheel. Exp. 112; Wats., King Exp. 84; Engl. Focke, Nat. Pflanz. III, 3, 37; Wats., Bibl. Ind. I, 284; Rothr., Alask. 445.

Kurile Isls.; Aleutian Isls.; Kamtk.; E. Asia and Japan.

North America: N. S., N. Br., Q., Ont. to L. Superior, Coast range, Selkirks, Queen Charlotte Isls. and Alaska; N. to 51° in N. W. T.; S. to N. Eng. and W. to Minn., Mo., Colo., and S. in Sierra Nevada to Calif.

Minn. valley: Forest district and to Chippewa valley; hillsides, high bluffs and banks.

HERB.: *Ballard* 876, Waconia; *Taylor* 845, Glenwood; *Bailey* 253, Vermilion lake; *Roberts* 27, Grand Marais; *Herrick* 88, Minnetonka.

Geum virginianum LINN. Spec. 500 (1753).*G. hirsutum* MUHL. Cat. 51 (1813).*G. heterophyllum* DESF. DC. Prodr. II, 550 (1825).

Wats. and Coult., Gray's Man. 6 ed. 156; Britt., Fl. N. J. 94; Webb., Fl. Neb. 128; Upham, Fl. Minn. 49; Mac., Fl. Can. I, 133, 515; Wats., Bibl. Ind. I, 286.

North America: N. S., N. Br., Ont., N. Eng., N. J.; W. to Minn., Neb., Kan.

Minn. valley: Forest district and W. to Chippewa valley or beyond; edges of woods and along streams.

HERB.: *Taylor* 429, Buffalo lake, Waseca Co.; *Sheldon* 287, Madison Lake; *Sheldon* 1004, Sleepy Eye; *Sheldon* 462, Madison Lake; *Sheldon* 862, Sleepy Eye; *Sandberg* 163, Cannon Falls; *Sandberg* 164, Chisago Co.; *Herb. Moyer* 71, Montevideo.

Geum album GMEL. Syst. II, 861 (1791).*G. canadense* JACQ. Hort. Vindob. II, 82 (1772) *not Murr.**G. carolinianum* WALT. Fl. Car. 150 (1788).*Caryophyllata alba* MOENCH, Meth. 660 (1794).*Geum virginianum* MURR. Com. Goett. V, 30 (1790).

Wats. and Coult., Gray's Man. 6 ed. 156; Britt., Fl. N. J. 94; Chap., Fl. S. St. 123; Webb., Fl. Neb. 128; Mac., Fl. Can. I, 133; Coult., Fl. Tex. 105; Cov., Fl. Ark. 179; Wats., Bibl. Ind. I, 283.

North America: N. S., N. B., Q., Ont., N. Eng., N. J. to Ga.; W. to Dak., Neb., Kan., Ark. and W. Tex.

Minn. valley: Throughout; edges of woods and copses.

HERB.: *Taylor* 892, Glenwood; *Ballard* 419, New Prague, Scott Co.; *Taylor* 613, Minnesota lake; *Ballard* 872,

Waconia; *Ballard* 294, Jordan, Scott Co.; *Kassube* 66, Minneapolis; *Sandberg* 162, Cannon Falls; *Herb. Sheld.* 1748, Minneapolis; *Herb. Moyer* 70, Montevideo.

AGRIMONIA LINN. Gen. 388 (1737).

Aremonia NECK. Elem. 768 (1790).

Amonia NESTL. Pot. 17 (1816).

Spallanzania POLL. Veron. 10 (1816).

Baillon, *Hist. Pl.* I, 462; Benth. and Hook., *Gen. Pl.* I, 622; Durand, *Ind. Gen. Phan.* 114; Engler and Prantl, *Nat. Pflanz.* 3, II, 43.

Living species: 10; 20+ described; 6-8 (B. and H.); temperate regions, N. hemisphere; tropical mts. and S. America. Russia, 4; Europe, 4; Russian Europe, 3; North America, 3; Calif., 1; S. Sts., 3; other regions, 1; 1 sp. through Asia, Europe and North America (ours).

Agrimonia eupatoria LINN. Spec. 448 (1753).

Wats. and Coult., *Gray's Man.* 6 ed. 161; Britt., *Fl. N. J.* 97; Webb., *Fl. Neb.* 128; Upham, *Fl. Minn.* 49; Coult., *Fl. Colo.* 87; Chap., *Fl. S. St.* 122; Brew. and Wats., *Fl. Calif.* I, 185; Hook., *Fl. Gt. Brit.* 128; Mac., *Fl. Can.* I, 142; Forbes and Hems., *Fl. Sin.* 246; Led., *Fl. Ross.* II, 31; Nym., *Fl. Eur.*; Mac., *Fl. Can.* I, 518; Miyabe, *Fl. Kur.* 232; Herd., *Fl. Eur. Russ.* 46; Greene, *Fl. Fran.* 61; Roth, *Wheel. Exp.* 115; Cov., *Fl. Ark.* 179; Engl. Focke, *Nat. Pflanz.* III, 3, 43; Wats., *Bibl. Ind.* I, 271; Hart., *Fl. Scand.* I, 277.

Europe, exc. N. Scand. and N. Russ.; N. Asia and China; Himalayas; N. and S. Africa.

North America: Newf., N. S. to N. J., Fla. and Miss.; W. to Man., Minn., Neb., Colo., Ark. and N. Mex.; also in Pac. coast reg.; Washington to S. Calif.

Minn. valley: Forest district and W. to Chippewa valley or beyond; edges of thickets and woodland openings.

HERB.: *Ballard* 805, Goose lake; *Sheldon* 868, Sleepy Eye; *Ballard* 692, Waconia; *Ballard* 491, Prior's lake, Scott Co.; *Taylor* 941, Glenwood; *Sheldon* 1183, New Ulm; *Bailey* 191, Vermilion lake; *Arthur* 164, Vermilion lake; *Roberts* 26, Duluth; *Sandberg* 160, Goodhue Co.; *Sandberg* 161, Cannon Falls; *Kassube* 65, Minneapolis.

ROSA LINN. Gen. 412 (1737).

Hulthemia DUM. Not. Hulth. (1840).

Lowea LINDL. Bot. Reg. 1261 (1842⁹).

Rhodophora NECK. Elem. 748 (1790).

Rhodopsis LED. *Fl. Alt.* II, 224 (1830).

Baillon, *Hist. Pl.* I, 461; Benth. and Hook., *Gen. Pl.* I, 625; Durand, *Ind. Gen. Phan.* 114; Engler and Prantl, *Nat. Pflanz.* 3, III, 46; Schenck, *Palaeophyt.* 667.

Living species: 600+ described; 100—distinct; 30 (B. and H.); 50–55 (Durand); N. hemisphere to Abyssinia, S. India and Mexico; temperate, subalpine and subtropical zones. Russia, 17; Europe, 41; Russian Europe, 16; North America, 20–25; Canada, 18–20; E. Sts., 10–11; S. Sts., 5–6; Rocky mts., 7; California, 8–10; Pl. Wheel., 5–6; Pl. King, 2; W. Tex., 4.

Fossil species: Oligocene, Bonn (*Weber.*); Rixhoft (*Heer*); Florissant, Colo. (*Lesquereaux*).

Rosa humilis MARSH. Arbust. Amer. 136 (1785).

? *R. parviflora* EHRH. Beitr. IV, 21 (1789).

R. lucida AUCT. AMER. principally.

R. caroliniana MICHX. Fl. N. Am. I, 295 (1803).

R. lyonii PURSH, Fl. Am. 345 (1814).

Wats. and Coult., Gray's Man. 6 ed. 163; Upham, Fl. Minn. 52; Chap., Fl. S. St., 126; Mac., Fl. Can. I, 143; Cov., Fl. Ark. 179; Engl. Focke, Nat. Pflanz. III, 3, 48; Wats., Bibl. Ind. I, 311.

North America: Newf., N. S., Q., Ont. to L. Huron reg.; S. to Maine, N. J. and Ga.; W. to Minn., Mo., Ark., Ind. Terr. and La.

Minn. valley: Reported from N. E. district and E. edge; dry soil or edges of marshes; no Minn. specimens seen.

Rosa carolina LINN. Spec. 2 ed. 703 (1762).

R. virginiana DUROI, Obs. Bot. 21 (1771).

R. corymbosa EHRH. Beitr. IV, 21 (1789).

R. carolinensis MARSH. Arbust. Amer. 135 (1785).

R. pennsylvanica MICHX. Fl. N. Am. I, 296 (1803) *in part*.

R. flexuosa RAF. Prec. Decouv. 35 (1814).

R. cinnamomea var. *gemella* SERINGE, DC. Prodr. II, 605 (1825).

Wats. and Coult., Gray's Man. 6 ed. 163; Britt., Fl. N. J. 98; Chap., Fl. S. St. 126; Upham, Fl. Minn. 52; Mac., Fl. Can. I, 143, 519; Cov., Fl. Ark. 179; Engl. Focke, Nat. Pflanz. III, 3, 48; Wats., Bibl. Ind. I, 310.

North America: Q. ? and Ont. to N. Car. and Fla.; W. to Minn., Ark., Miss. and La.

Minn. valley: Forest district to Blue Earth Co.; rare; low grounds and borders of swamps.

Rosa pisocarpa GRAY, Proc. Am. Acad. VIII, 382 (1882).

R. woodsii LINDL. Ros. Monog. 21 (1820) *chiefly*.

? *R. rafinesquii* SERINGE, DC. Prodr. II, 611 (1825) *in part*.

R. fendleri CREPIN, Prim. Ros. 432 (1880) *included*.

Wats. and Coult., Gray's Man. 6 ed. 163; Webb., Fl. Neb. 127; Coult., Fl. Colo. 88; Upham, Suppl. Minn. 47; Mac., Fl. Can. I, 521; Wats., Bibl. Ind. 313; Brew. and Wats., Fl. Calif. I, 187?

North America: Saskatchewan, Gt. Slave lake and N. W. T. to Alaska?; W. to Rockies and N. to lat. 51°; S. to Minn., Mo., Colo., N. Mex. and W. to Mont. and Calif?.

Minn. valley: Reported from N. E. district, but no Minn. specimens seen.

Rosa acicularis LINDL. Monog. Ros. 44 (1820).

R. sayi SCHWEIN. Keat. Narr. II, Appx. 113 (1825).

R. acicularis var. *bourgeauiana* CREPIN, Prim. Ros. 386, 390 (1880).

R. engelmanni S. WATS. Proc. Am. Acad. XX, 342 (1885).

Wats. and Coult., Gray's Man. 6 ed. 162; Upham, Suppl. Minn. 47; Coult., Fl. Colo. 87; Mac., Fl. Can. I, 144, 520, II, 320; Trautv., Fl. Sib. 54 in var.; Nym., Fl. Eur.; Forbes and Hems., Fl. Sin. 248; Herd., Fl. Eur. Russ.

N. Europe; W. and N. Asia to China.

North America: Wisc., Mich. and Minn.; N. to Man., N. W. T. and Alaska; W. to Mont. and Pac. coast, in Oregon and Brit. Col.

Minn. valley: N. E. district and N. edge; rare; woodland openings and banks of streams.

HERB.: *Arthur* 81, Two Harbors; *Bailey* 84, Vermilion lake; *Bailey* 223, Vermilion lake.

Rosa virginiana MILL. Dict. (1768).

R. blanda AIR. Hort. Kew. II, 202 (1789).

R. fraxinifolia GMEL. Fl. Bad. II, 413 (1806).

R. gemella WILLD. Enum. 544 (1809) *mainly*.

R. cinnamomea var. *glabella* SERINGE, DC. Prodr. II, 605 (1825).

R. blanda var. *pubescens* CREPIN, Prim. Ros. 394 (1880).

Wats. and Coult., Gray's Man. 6 ed. 162; Upham, Fl. Minn. 52; Upham, Suppl. Minn. 47; Webb., Fl. Neb. 127; Coult., Fl. Colo. 87?; Britt., Fl. N. J. 98; Mac., Fl. Can. I, 194, 519; Cov., Fl. Ark. 179; Wats., Bibl. Ind. I, 309.

North America: Newf., Q. to N. J.; W to Hudson Bay, Brit. Col?, L. Winnipeg, Minn., Dak., Neb. and Ark.; and possibly also in Colo.

Minn. valley: Throughout, common; banks, rocks, hillsides and low prairies.

HERB.: *Taylor* 844½, Minnesota lake; *Taylor* 844, Glenwood; *Taylor* 272, Janesville; *Ballard* 21, Chaska; *Ballard* 223, Jordan, Scott Co.; *Sheldon* 1347, Verdi, Lincoln Co.; *Ballard* 89, Chaska; *Sheldon* 368, Madison Lake; *Taylor* 15, Elysian; *Bailey* 34, Vermilion lake; *Sandberg* 184, Cannon Falls; *Sandberg* 185, Cannon Falls. *Kassube* 81, Minneapolis; *Kassube* 82, Minneapolis; *Holzinger* 71, Winona Co.; *Hammond* 16, Lake City; *Herb. Sheld.* 1804, Minneapolis; *Herb. Wickersheim* 44, Idlewild, Lincoln Co.; *Herb. Moyer* 78, Montevideo.

Rosa virginiana var. **arkansana** (PORTER).

R. arkansana PORT. Fl. Colo. 38 (1874).

R. blanda var. *setigera* CREPIN, Prim. Ros. 394 (1880).

R. blanda var. *arkansana* BEST, Torr.-Bull. XVII, 145 (1890).

Wats. and Coult., Gray's Man. 6 ed. 163; Webb., Fl. Neb. 127; Coult., Fl. Colo. 87; Mac., Fl. Can. I, 520; Coult., Fl. Tex. 106; Roth., Wheel. Exp. 115; Cov., Fl. Ark. 179; Wats., Bibl. Ind. I, 310; Upham, Suppl. Minn. 47.

North America: Man., N. W. T. and Rockies of Brit. Col. to Minn., Neb., Mo., Ark. and Tex., W. to Arizona, Colo. and Mont.

Minn. valley: Forest district and probably sparingly westward; dry sunny hillsides and banks.

HERB.: *Ballard* 407, New Prague; *Ballard* 567, Prior's lake, Scott Co.; *Ballard* 92, Shakopee; *Ryan* 1, Goodhue Co.; *Roberts* 35, Duluth; *Leonard* 17, Spring Valley.

PRUNUS JUSS. Gen. 341 (1774) *em.*

Armeniaca JUSS. Gen. 341 (1774).

Prunophora NECK. Elem. II, 71 (1790).

Amygdalopsis CARRIERE, Rev. Hort. 91 (1862).

Prunopsis ANDRE, ex Durand Ind. Phan. 111 (1888).

Baillon, *Hist. Pl.* I, 417, 418; Benth. and Hook., *Gen. Pl.* I, 609, 610; Durand, *Ind. Gen. Phan.* l. c.; Schenck, *Palaeophyt.* 674; Engler and Prantl, *Nat. Pflanz.* 3, III, 51, *seq.* (Focke).

Living species: 20±; temperate regions, N. hemisphere; North America. 8–10; Calif., 2; Canada, 3; S. Sts., 6–7; E. Sts., 2; Rocky mts., 4–5; Pl. King, 2; Russia, 4–5; Europe, 6.

Fossil species: 10–12; Tertiary; Siberia (*Heer*); Spitzbergen (*Unger*); Germany (*Weber*); Greenland (*Heer*); Russia (*Heer*, *Ettinghausen*).

Prunus americana MARSH. Arbust. Am. 111 (1785).

? *P. mississippi* MARSH. Arbust. Am. 112 (1785).

? *P. spinosa* WALT. Fl. Car. 146 (1788).

P. hiemalis MICHX. Fl. N. Amer. I, 284 (1803) *in part.*

P. nigra MUHL. Cat. 49 (1817).

Cerasus hiemalis DC. Prodr. II, 538 (1825) *in part.*

C. nigra HOOK. Comp. Bot. Mag. I, 24 (1835).

C. americana HOOK. Comp. Bot. Mag. I, 24 (1835).

Wats. and Coult., Gray's Man. 6 ed. 151; Britt., Fl. N. J. 91; Upham, Fl. Minn. 48; Webb., Fl. Neb. 128; Chap., Fl. S. St. 119; Coult., Fl. Colo. 76; Mac., Fl. Can. I, 124; Coult., Fl. Tex. 102; Cov., Fl. Ark. 178; Engl. Focke, *Nat. Pflanz.* 3, III, 53; Wats., Bibl. Ind. I, 303; Sarg., N. Am. Silva IV, 19.

North America: N. Y. and N. J. to Fla.; W. to Mont., Colo., N. Mex. and Mexico.

Minn. valley: Throughout; thickets and along banks of streams and by prairie sloughs.

HERB.: *Kassube* 60, Minneapolis; *Sandberg* 149, Red Wing; *Herb. Wickersheim* 34, Idlewild, Lincoln Co.; *Herb. Moyer* 67, Montevideo.

CERASUS JUSS. Gen. 340 (1774).**Cerasedios** S. and Z. Abh. Münch. Akad. III, 743 (—).**Cerasophora** NECK. Elem. 720 (1790).**Tubopadus** POMEL, Nat. Atlant. 8 (1860).

Baillon, *Hist. Pl.* I, 419; Benth. and Hook., *Gen. Pl.* I, 609, 610; Durand, *Ind. Gen. Phan.* 112; Schenck, *Palaeophyt.* 676; Engler and Prantl, *Nat. Pflanz.* III, 3, 54 (Focke); Sarg., *N. Am. Silva* IV, 8.

Living species: 15+; temperate and warmer regions, N. hemisphere.

Fossil species: 2-3; Tertiary, Europe (*Unger*) and Leoben (*Ettinghausen*).

Cerasus pumila (LINN.) MICHX. Fl. N. Am. I, 286 (1803.)*Prunus pumila* LINN. Mant. 75 (1767).*Cerasus glauca* MOENCH, Meth. 672 (1794).*Prunus depressa* PURSH, Fl. Am. 332 (1814).*P. cuneata* RAF. Ann. Nat. 11 (1820).*Cerasus depressa* SERINGE, DC. Prodr. II, 538 (1825).

Wats. and Coult., Gray's Man. 6 ed. 152; Upham, Fl. Minn. 48; Webb., Fl. Neb. 129; Britt., Fl. N. J. 92; Mac., Fl. Can. I, 124; Cov., Fl. Ark. 178; Wats., Bibl. Ind. I, 306.

North America: Montreal to Gt. lakes and 106th mer.; N. Br. to N. Eng., N. J. and Va.; W. to Dak., Neb., Kan. and Ark.

Minn. valley: S. edge and in vicinity of Ft. Snelling; local; sandy banks and rocky places.

HERB.: *Sheldon 1484*, Pipestone City; *Sandberg 150*, Goodhue Co.; *Kassube 61*, Minneapolis; *Sandberg 151*, Two Harbors.

Cerasus serotina (EHRH.) LOISEL. Nouv. Duham. V, 3, (1814).*P. virginiana* MILL. Dict. (1768).*Prunus serotina* EHRH. Beitr. III, 20 (1788).*Cerasus virginiana* MICHX. Fl. N. Am. I, 285 (1803).*Prunus cartilaginea* LEHM. Ind. Sem. Hamb, (1833).*Padus virginiana* ROEM. Syn. Monog. III, 86 (1847).*P. cartilaginea* ROEM. Syn. Monog. III, 86 (1847).*P. serotina* AGH. Theor. Syst. t. 14, f. 8 (1858).

Wats. and Coult., Gray's Man. 6 ed. 152; Britt., Fl. N. J. 92; Webb., Fl. Neb. 129; Upham, Fl. Minn. 48; Chap., Fl. S. St. 120; Mac., Fl. Can. I, 126, 513; Cov., Fl. Ark. 178; Coult., Fl. Tex. 103; Engl. Focke, Nat. Pflanz. 3, III, 55; Wats., Bibl. Ind. I, 307; Sarg., N. Am. Silva IV, 45.

Peru and Colombia,

North America: N. S., N. Br., Ont. to Man.; S. to N. J. and Fla.; W. to Dak., Neb., Kan., Ind. Terr., La. and Tex.; also, Arizona, Mexico and C. America (mts.).

Minn. valley: Forest region; woods and shaded lake shores or banks.

HERB.: *Taylor* 482, Janesville; *Taylor* 612, Minnesota lake; *Taylor* 480, Janesville; *Sheldon* 100, Elysian; *Sheldon* 310, Madison Lake; *Ballard* 346, Helena, Scott Co.; *Herrick* 85, Minneapolis; *Sandberg* 154, Red Wing; *Herb. Sheld.* 1853, Minneapolis.

***Cerasus virginiana* (LINN.) LOISEL.** Nouv. Duham. V, 3, (1814).

Prunus virginiana LINN. Spec. 473 (1753) *excl. syn.*

Padus rubra MILL. Dict. (1768).

Prunus nana DU ROI, Harbk. Baumz. II, 194 (1772).

Prunus-Cerasus canadensis MARSH. Arbust. Amer. 113 (1785).

Prunus rubra AIT. Hort. Kew. II, 162 (1789).

Padus oblonga MOENCH, Meth. 671 (1794).

Prunus serotina POIR. Enc. Meth. V, 665 (1804).

P. hirsuta ELL. Sk. I, 541 (1821).

P. obovata BIGEL. Fl. Bost. ed. 2, 192 (1824).

Cerasus serotina HOOK. Fl. Bor.-Am. I, 169 (1833) *excl. syn.*

C. obovata BECK, Bot. 97 (1833).

C. micrantha, *densiflora*, *fimbriata* and *hirsuta* SPACH, Suit. Buff. I, 414-417 (1834).

C. virginiana var. *B.* T. and G. Fl. I, 410 (1838).

C. duerinckii MART. Sel. Sem. Lovan. (1840).

Prunus duerinckii WALP. Rep. II, 10 (1843).

Padus fimbriata, *densiflora*, *micrantha*, *obovata* and *hirsuta* ROEM. Syn. Monog. III, 84-87 (1847).

Wats. and Coult., Gray's Man. 6 ed. 152; Britt., Fl. N. J. 92; Webb., Fl. Neb. 129; Coult., Fl. Colo. 77; Chap., Fl. S. St. 120; Upham, Fl. Minn. 48; Mac., Fl. Can. I, 125; Coult., Fl. Tex. 103; Wats., King. Exp. 80; Engl. Focke, Nat. Pflanz. III, 3, 55; Wats., Bibl. Ind. I, 307; Sarg., N. Am. Silva IV, 41.

North America: Labr., Newf., N. S., N. Br. to Man., Brit. Col. and Pac.; N. on Mackenzie river to 62°; U. S. to Ga., Tex. and Mex.; Calif. and Oregon.

Minn. valley: Throughout, banks of streams and shores of lakes.

HERB.: *Taylor* 713, Minnesota lake; *Taylor* 489, Janesville; *Sheldon* 35, Elysian; *Sheldon* 384, Madison Lake; *Ballard* 541, Cleary's lake, Scott Co.; *Bailey* 238, Vermilion lake; *Herrick* 84, Minneapolis; *Kassube* 62, Minneapolis; *Bailey* 419, Long lake; *Sandberg* 153, Cannon Falls; *Herb. Moyer* 68, Montevideo; *Herb. Wickersheim* 35, Idlewild, Lincoln Co.; *Herb. Sheld.* 1855, Minneapolis; *Herb. Moyer* 251, Montevideo.

***Cerasus pensylvanica* (LINN. f.) LOISEL.** Nouv. Duham. V, 9 (1814).

Prunus pensylvanica LINN f. Syst. ed. 13, Suppl. 252 (1781).

Prunus-Cerasus montana MARSH. Arbust. Am. 113 (1785).

Prunus lanceolata WILLD. Berl. Baumz. 240 (1796).

Cerasus borealis MICHX. Fl. Bor.-Am. I, 286 (1803).

Prunus borealis POIR. Enc. Meth. V, 674 (1804).

P. persicifolia DESF. Hist. Arb. II, 205 (1809).

Cerasus persicifolia LOISEL. Nouv. Duham. V, 9 (1814).

Wats. and Coult., Gray's Man. 6 ed. 152; Britt., Fl. N. J. 92; Upham, Fl. Minn. 48; Chap., Fl. S. St. 120; Coult., Fl. Colo. 77; Mac., Fl. Can. I, 125; Wats., Bibl. Ind. I, 306; Sarg., N. Am. Silva, IV, 35.

North America: Newf., N. S., N. Br. to Man., Brit. Col. and Coast range; N. to Hudson Bay; S. to N. Eng., N. J. and mts. of N. Car.; W. to Minn., Colo., Tenn. and Kan.

Minn. valley: Forest district; in dry woods, hillsides and river banks; N. E. and E.; N. edge.

HERB.: *Ballard* 347, Helena, Scott Co.; *Ballard* 156, Chaska; *Sheldon* 658, Waseca; *Bailey* 169, Vermilion lake; *Bailey* 351, Mud river; *Herrick* 83, Minneapolis; *Sandberg* 152, Red Wing; *Herb. Moyer* 250, Montevideo.

LII. LEGUMINOSAE. Pulse Family.

Endlicher, *Gen. Pl.* 1253 (1840); Lindl. *Veg. King.* 544 (1846)—*Fabaceae*; Benth. and Hook., *Gen. Pl.* I, 434 (1865); Baillon, *Hist. Pl.* II, 21 (1869, 1870); Taubert in *Engler and Prantl, Nat. Pflanz.* 3, III, 70 (1891).

Genera: 400±; cosmopolitan, except in far antarctic islands and rare in New Zealand; sub-family *Mimosoideae* centers in tropical America; sub-family *Caesalpinioideae*, in Brazil; *Papilionatae* in the steppes of Asia where there are 1250 species of *Astragalus* (*Tragacantha*) alone. Fossil genera; 6 doubtful; 1 described; Tertiary and Quaternary.

Species: 7500±, 80 per cent.+, in the *Papilionatae*; all regions of the earth.

ACUANIA MED. Theod. Sp. Pg. 62 (1786).

Desmanthus WILLD. Spec. IV, 1044 (1805) *in part*.

Darlingtonia DC. Ann. Sci. Nat. Ser. 1, IV, 97 (1824).

Baillon, *Hist. Pl.* II, 67; Benth. and Hook., *Gen. Pl.* I, 592; Durand, *Ind. Gen. Phan.* 109; O. Kuntze, *Rev. Gen.* I, 158; Engler and Prantl, *Nat. Pflanz.* 3, III, 117 (Taubert).

Living species: 10; N. and S. America; 1 sp. around the world in tropical regions. North America, 8-9; W. Tex., 8; E. Sts., 2; S. Sts., 1; Pl. Wheel., 2; mostly subtropical.

Acuania illinoensis (MICHX.) OK. Rev. Gen. I, 158 (1891).

Mimosa illinoensis MICHX. Fl. N. Am. II, 254 (1803).

Acacia brachyloba WILLD. Spec. IV, 1071 (1805).

Darlingtonia brachyloba DC. Mem. Leg. 427 (1824).

D. brevifolia RAF. N. Fl. I, 42 (1836).

Desmanthus brachylobus BENTH. Hook. Journ. Bot. IV, 358 (1842).

D. illinoensis MACM. MSS. (1889).

Wats. and Coult., Gray's Man. 6 ed. 149; Upham, Fl. Minn. 48.

North America: Ind. and Ky. to Minn., Mo., Ark. and Tex.; also in Fla.

Minn. valley: Reported from Swan lakes, Redwood Co.

CASSIA LINN. Gen. 347 (1737).

Herpetica RUMPH. ex Baillon Hist. Pl. II, 124 (1870).

Bactrylobium WILLD. Enum. 439 (1809).

Cathartocarpus PERS. Syn. I, 459 (1805).

Chamaecrista E. MEY. Comm. Afr. Austr.

Grimaldia SCHRANK, Münch. Dst. 103 (1803).

Psilorhegma VOG. Syn. Cass. (1837).

Macleaya MONTZ. Mem. Acad. Lyon. X, 199 (1846).

Senna GAERTN. Fruct. II, 312 (1791).

Xamacrista RAF. Sylv. Tell. 127 (1836).

Baillon, *Hist. Pl.* II, 187; Benth. and Hook., *Gen. Pl.* I, 571, 1003; Durand, *Ind. Gen. Phan.* 106; Schenck, *Paleophyt.* 697; Engler and Prantl, *Nat. Pflanz.* 3, III. 157 (Taubert).

Living species: Described, 475; distinct, 380±; all temperate and warmer regions. North America, 20–22; W. Tex., 9; S. Sts., 7; E. Sts., 4; Calif., 2; Rocky mts., 1; Pl. Wheel., 5. Center in Middle and S. America.

Fossil species: Several described; Cretaceous of Bohemia and Greenland (*Heer*); Tertiary, S. France, Germany, Switzerland (*Unger, Heer*); Pliocene, valley of the Andes (*Unger*); North America, Tertiary!

Cassia chamaecrista LINN. Spec. 379 (1753),

C. pulchella SALISB. Prodr. 326 (1796).

C. fasciculata MICHX. Fl. N. Am. I, 262 (1803).

Xamacrista triflora RAF. Sylv. Tellur. 127 (1838).

Wats. and Coult., Gray's Man. 6 ed. 148; Britt., Fl. N. J. 90; Webb., Fl. Neb. 129; Chap., Fl. S. St. 115; Upham, Fl. Minn. 47; Coult., Fl. Colo. 73; Coult., Fl. Tex. 92; Cov., Fl. Ark. 178; Wats., Bibl. Ind. I, 206.

North America: N. Eng. and N. J. to Fla. and Miss.; W. to Minn., Dak., Colo., Neb., Ark. and W. Tex. on the Rio Grande.

Minn. valley: throughout; especially in prairie districts; sunny banks, roadsides and along streams.

HERB.: *Sheldon* 1213, New Ulm; *Sheldon* 812, Cottonwood river, near Sleepy Eye; *Sheldon* 618, Wilton, Waseca Co.; *Kassube* 59, Minneapolis; *Oestlund* 38, Minneapolis; *Holzinger* 63, Winona Co.; *Sandberg* 148, Cannon Falls; *Holzinger* 64, Winona Co.

GYMNOCLADUS LAM. Enc. Meth. I, 733 (1783) *in part*.

Guilandina LINN. Gen. ed. V, 464 (1754) *in part*.

Baillon, *Hist. Pl.* II, 175; Benth. and Hook., *Gen. Pl.* I, 568; Durand, *Ind. Gen. Phan.* 105; Schenck, *Palaeophyt.* 695.

Living species: 2; North America, 1; E. China, 1.

Fossil species: Tertiary of Europe (*Saporta*); 1 sp.

Gymnocladus dioica (LINN.) KOCH, *Dendr.* I, 5 (1869).

Gulandina dioica LINN. *Spec.* 381 (1753).

Gymnocladus canadensis LAM. *Enc. Meth.* I, 733 (1783).

Hyperanthera dioica VAHL, *Symb.* I, 31 (1790).

Wats. and Coult., *Gray's Man.* 6 ed. 148; Webb., *Fl. Neb.* 129; Upham, *Fl. Minn.* 48; Mac., *Fl. Can.* I, 123, 512; Herd., *Fl. Eur. Russ.* 44; Cov., *Fl. Ark.* 177; Wats., *Bibl. Ind.* I, 222; Sarg., *N. A. Silv.* III, 69.

Introduced sparingly in Russia.

North America: S. Ont., W. N. Y. and Penn.; W. to S. Minn., E. Neb., E. Kan., S. W. Ark.; S. to Tenn. and Ind. Terr.

Minn. valley: Forest district, especially S. W. to Cottonwood valley and New Ulm.

HERB.: *Sheldon* 778, Cottonwood river, near Sleepy Eye; *Sheldon* 655, Waseca; *Sheldon* 454, Madison Lake.

BAPTISIA VENT. *Dec. Gen.* Nov. 9 (1808).

Crotalopsis MICHX. *MSS. ex DC. Mem. Leg.* 4 (1825).

Baillon, *Hist. Pl.* II, 349; Benth. and Hook., *Gen. Pl.* I, 466; Durand, *Ind. Gen. Phan.* 87.

Living species: 14; North America; S. Sts., 14; Canada, 2; E. Sts., 6.

Baptisia leucophaea NUTT. *Gen.* I, 282 *and add.* (1818).

Podalyria bracteata MUHL. *Cat. ed.* 2, 42 (1818).

Wats. and Coult., *Gray's Man.* 6 ed. 126; Britt., *Fl. N. J.* 80; Webb., *Fl. Neb.* 133; Upham, *Fl. Minn.* 47; Chap., *Fl. S. St.* 112; Cov., *Fl. Ark.* 173; Wats., *Bibl. Ind.* I, 204.

North America: Mich. to Minn. and Neb.; S. to Ark., Tex. and Ga.; adv. in N. J. and along Atl. coast.

Minn. valley: S. edge and extending to N. E. district; absent in most districts; fields, pastures and meadows.

HERB.: *Juni* 2, "Minnesota;" *Holzinger* 62. Winona Co.

Baptisia leucantha T. and G. *Fl.* I, 385 (1838).

Podalyria alba SIMS, *Bot. Mag.* 1177 (1809).

Baptisia alba HOOK. *Fl. Bor.-Am.* I, 129 (1833) *not R. Br.* (1810).

Wats. and Coult., *Gray's Man.* 6 ed. 126; Webb., *Fl. Neb.* 133; Chap., *Fl. S. St.* 112; Upham, *Fl. Minn.* 47; Mac., *Fl. Can.* I, 123; Cov., *Fl. Ark.* 173; Wats., *Bibl. Ind.* I, 204.

North America: Ont. to Ohio, S. Car. and Fla.; W. to Minn., Neb., Ark. and La.

Minn. valley: Reported as frequent; W. to Chippewa river, and especially N. E. and E.; banks of streams.

HERB.: *Leonard* 14, Washington P. O.; *Sandberg* 147, White Rock.

Baptisia tinctoria (LINN.) R. BR. Ait. f. Hort. Kew. III, 6 (1811).

Sophora tinctoria LINN. Spec. 373 (1753).

Podalyria tinctoria LAM. Ill. II, 471 (1793).

Wats. and Coult., Gray's Man. 6 ed. 125; Britt., Fl. N. J. 80; Chap., Fl. S. St., 111, Upham. Fl. Minn. 47; Mac., Fl. Can. I, 123, 512; Cov., Fl. Ark. 173; Wats., Bibl. Ind. I, 205.

North America: Ont. and N. Eng. to N. J. and Fla.; W. to Minn., Ark. and La.

Minn. valley: Reported from Dakota Co. and the vicinity of Ft. Snelling; sandy soil and hillsides.

HERB.: *Manning* 2, Lake City.

FALCATA GMEL. Syst. 1131 (1791).

Amphicarpaea DC. Prodr. II, 383 (1825).

Amphicarpa ELL. Jour. Acad. Phil. I, 372 (1828).

Cryptolobus SPRENG. Syst. III, 218 (1826) *in part*.

Savia RAF. N. Y. Med. Rep. II, hex. V, 350 (1808) *not W.*

Xypherus RAF. Journ. Phys. LXXXIX, 260 (1819).

Baillon, *Hist. Pl.* II, 253; Benth. and Hook. *Gen. Pl.* I, 529; Durand, *Ind. Gen. Phan.* 98; O. Kuntze, *Rev. Gen.* I, 185.

Living species: 7; North America, Japan and Himalayas; N. America, 2; Canada, 1; S. Sts., 2; E. Sts., 2.

Falcata comosa (LINN.) OK. Rev. Gen. I, 182 (1891).

Glycine comosa LINN. Spec. 751 (1753).

G. monoica LINN. Spec. ed. 2, 1023 (1762).

Anonymus caroliniensis WALT. Fl. Car. 188 (1788).

Glycine sarmentosa ROTH, Catalect. II, 87 (1800).

Amphicarpaea sarmentosa NUTT. Gen. II, 114 (1818).

A. monoica ELL. Jour. Acad. Phil. I, 373 (1818).

A. comosa RIDD. Syn. Fl. W. S. 26 (1835).

Phaseolus monoicus EAT. and WR. Man. 353 (1840).

Wats. and Coult., Gray's Man. 6 ed. 146; Britt., Fl. N. J. 89; Webb., Fl. Neb. 130; Upham, Fl. Minn. 47; Chap., Fl. S. St. 107; Mac., Fl. Can. I, 123; Cov., Fl. Ark. 177; Wats., Bibl. Ind. I, 188.

A closely related species in China.

North America: N. Br., Q., Ont. to Man.; S. to N. Eng., N. J., Fla. and Miss.; W. to Minn., Neb., Kan. and Ark.

Minn. valley: Throughout; woods and riverbanks; common.

HERB.: *Sheldon* 1562, Lake Benton; *Taylor* 233, Janesville; *Taylor* 333, Janesville; *Sheldon* 1052, Sleepy Eye; *Taylor*

944, Glenwood; *Oestlund* 36, Minneapolis; *Oestlund* 37, Hennepin Co.; *Sandberg* 146, Red Wing; *Herb. Moyer* 66, Chippewa river near Montevideo.

PHASEOLUS LINN. Gen. 573 (1737).

Strophostyles ELL. Bot. Sk. Car. II, 229 (1824).

Phasellus MOENCH, Meth. 240 (1794).

Baillon, *Hist. Pl.* II, 240; Benth. and Hook., *Gen. Pl.* I, 538; Durand, *Ind. Gen. Phan.* 100; Schenck, *Palaeophyt.* 684.

Living species: 150 described; 60 reduced. All temperate and tropical regions. Russian Europe, 1; North America, 15; S. Sts., 4; E. Sts., 4; W. Tex., 9; Canada, 1; Pl. Wheel., 2.

Fossil species: Tertiary, old world, (*Unger*). Doubtful.

Phaseolus pauciflorus BENTH. Comm, Legum. Gen. 76 (1837).

Strophostyles pauciflorus S. WATSON, Wats. and Coult., Gray's Man. 6 ed. 145 (1890).

Webb., Fl. Neb. 130; Upham, Fl. Minn. 47; Coult., Fl. Tex. 90; Cov., Fl. Ark. 177; Wats., Bibl. Ind. I, 250.

North America: Ind. to Minn. and Neb.; S. to Ark.; Miss. and Tex.

Minn. valley: Reported as frequent in forest district; shaded banks and shores of lakes.

HERB.: *Sandberg* 145, Red Wing.

Phaseolus angulosus (MUHL.) ORT. Nov. Pl. 24 (1810?).

? *P. helvolus* LINN. Spec. 224 (1753) *in part.*

Glycine angulosa MUHL. Willd. Spec. III, 1056 (1802).

Phaseolus diversifolius PERS. Syn. II, 296 (1807).

Strophostyles angulosa ELL. Sk. II, 229 (1824).

Wats. and Coult., Gray's Man. 6 ed., 145; Britt., Fl. N. J. 90; Upham, Fl. Minn. 47; Chap., Fl. S. St. 106; Webb., Fl. Neb. 129; Mac., Fl. Can. I, 122; Coult., Fl. Tex. 90; Wats., Bibl. Ind. I, 250.

North America: Q., Ont. to Mass. and N. J.; S. to Fla. and Miss.; W. to Minn. Neb., Kan. and Tex.

Minn. valley: Forest district to Blue Earth Co. and New Ulm; sandy fields and shaded riverbanks.

HERB.: *Leiberg* 17, Blue Earth Co.; *Sandberg* 143, Red Wing; *Sandberg* 144, Goodhue Co.

Phaseolus polystachyos (LINN.) B. S. P. Cat. N. Y. (1888).

Dolichos polystachyos LINN. Spec. 726 (1753).

Phaseolus perennis WALT. Fl. Car. 182 (1788).

P. paniculatus MICHX. Fl. N. Am. II, 60 (1803).

P. macrostachys ELL. Journ. Acad. Phil. I, 324 (1828).

Wats. and Coult., Gray's Man. 6 ed. 144; Britt., Fl. N. J. 89; Webb., Fl. Neb. 130; Upham, Fl. Minn. 47; Chap., Fl. S. St. 106; Wats., Bibl. Ind. I, 250.

North America: N. Eng. to N. J., Fla. and Miss.; W. to Minn., Neb., Kan. and La.

Minn. valley: Reported from N. E. district; Ft. Snelling; thickets and edges of woods; shady riverbanks.

LATHYRUS LINN. Gen. 590 (1737).

Clymenum TOURN. Inst. 218 (1700).

Ochrus, Aphaca and **Nissolia** TOURN. l. c. 396, 399, 656 (1700).

Orbus LINN. Gen. 591 (1737).

Cicerella MOENCH, Meth. 63 (1794).

Astrophia NUTT. T. and G. Fl. N. Am. I, 278 (1838).

Platystylis SWEET, Brit. Fl. Gard. 239 (1829).

Aneurus E. MEY. Preuss. Gatt. 258 (1839).

Cicercula, Navidura, Lastila, Graphiosa ALEF. Bonplan-dia. 126-139 (1861).

Baillon, *Hist. Pl.* II, 238; Benth. and Hook., *Gen. Pl.* I, 526; Durand, *Ind. Gen. Phan.* 98; Schenck, *Palaeophyt.* 692.

Living species: 200 described; 120 distinct; temperate northern hemisphere and S. America. Russia, 21; Europe, 36; Russian Europe, 17; North America, 14; Mid. Calif., 10; S. Sts., 3; Canada, 4; Rocky mts., 4; E. Sts., 6; Pl. King, 3; Pl. Wheel., 5.

Fossil species: Germany; Pliocene (*Schenck*). Doubtful.

Lathyrus palustris LINN. Spec. 733 (1753).

L. polymorphus GRAY, *Ive's Rep.* 10 (1858?) *in part.*

L. lanszwertii KELL. *Proc. Cal. Acad.* II, 150 (1863).

Wats. and Coult., *Gray's Man.* 6 ed. 144; Britt., *Fl. N. J.* 88; Upham, *Fl. Minn.* 47; Hook., *Fl. Gt. Brit.* 112; Trautv., *Fl. Sib.* 45; Coult., *Fl. Colo.* 73; Brew. and Wats., *Fl. Calif.* I, 159; Mac., *Fl. Can.* I, 122; Forbes and Hems., *Fl. Sin.* 186; Led., *Fl. Ross.* I, 686; Nym., *Fl. Eur.*; Herd., *Fl. Eur. Russ.* 42; Coult., *Fl. Tex.* 87; Roth., *Wheel. Exp.* 102; Wats., *King Exp.* 78, 419; Wats., *Bibl. Ind.* I, 230.

Europe; N. Asia; Siberia, Dahuria and China.

North America: Labrador, N. Br., Q., Ont. to Brit. Col.; S. to Washington, Oregon, Los Angeles, Calif. and W. Tex.; from Mont. to N. J.

Minn. valley: Forest district and to Pomme des Terres valley; moist woods, springs and bogs.

HERB.: *Taylor* 610, Minnesota lake; *Ballard* 42, Chaska; *Oestlund* 34, Hennepin Co.; ? *Bailey* 443, Long lake; ? *Bailey* 65, Vermilion lake; *Kassube* 58, Tuttle's creek, Hennepin Co.; *Sandberg* 140, Chisago Co.; *Holzinger* 61, Winona Co.; *Herrick* 82, Minneapolis; *Herb. Moyer* 65, Montevideo.

Lathyrus palustris LINN. var. myrtifolius (MUHL.) GBAY *Pl. Fendl.* 30 (1849).

L. myrtifolius MUHL. Willd. Spec. III, 1091 (1802).

L. stipulaceus TORR. Cat. N. Y. 92 (1819).

L. venosus var. *D.* T. and G. Fl. I, 274 (1838).

L. polyphyllus Wats. King. Exp. 78 (1871).

L. pubescens PORT. Fl. Colo. 32 (1874).

Wats. and Coult., Gray's Man. 6 ed. 144; Britt., Fl. N. J. 88; Coult., Fl. Colo. 73; Brew. and Wats., Fl. Calif. I, 159; Chap., Fl. S. St. 99; Mac., Fl. Can. I, 122; Wats., Bibl. Ind. I, 230.

North America: N. Br., Q. to Ont. and Minn.; S. to N. Car.; further range like that of type.

Minn. valley: Forest district to Blue Earth Co.; N. edge; swamps and damp woods.

HERB.: *Sandberg 141*, Wyoming.

***Lathyrus glaucifolius* BECK.** Bot. 90 (1833).

L. pisiformis RICH. Frankl. Journ. 17 (1823).

L. ochroleucus HOOK. Fl. Bor.-Am. I, 159 (1833).

L. albidus EAT. Man. (1836).

Orobis ochroleucus A. BR. Ind. Sem. Berol. (1853).

Wats. and Coult., Gray's Man. 6 ed. 143; Britt., Fl. N. J. 89; Upham, Fl. Minn. 46; Mac., Fl. Can. I, 122; Wats., Bibl. Ind. I, 229.

North America: Ottawa to Coast range of Brit. Col., and N. on Mackenzie river within the Arctic circle; S. to N. Eng., N. J. and W. to Minn., Iowa and Man.

Minn. valley: Throughout; hillsides and shores of lakes and streams.

HERB.: *Ballard 597*, Prior's lake, Scott Co.; *Ballard 230*, Jordan, Scott Co.; *Sheldon 160*, Madison Lake; *Ballard 131*, Chaska; *Bailey 187*, Vermilion lake; *Kassube 57*, Minneapolis; *Herrick 81*, Minneapolis; *Arthur 63*, Vermilion lake; *Sandberg 139*, Goodhue Co.; *Herb. Wickersheim 33*, Ash lake, Lincoln Co.

***Lathyrus venosus* MUHL.** Willd. Spec. III, 1092 (1802).

L. decaphyllus HOOK. Fl. Bor.-Am. I, 159 (1833).

Orobis venosus A. BR. Ind. Sem. Berol. (1853).

Lathyrus ochroleucus TORR. Wilkes Exp. 267 (1858).

Wats. and Coult., Gray's Man. 6 ed. 143; Britt., Fl. N. J. 88; Chap., Fl. S. St. 99; Coult., Fl. Colo., 73; Brew. and Wats., Fl. Calif. I, 159; Upham, Fl. Minn. 46; Mac., Fl. Can. I, 121; Roth., Wheel. Exp. 102; Cov., Fl. Ark. 176; Wats., Bibl. Ind. I, 231.

North America: L. Superior reg. to Pac. and N. lat. 52°; Washington, N. Calif. and Saskatchewan to Penn. and N. J.; S. in mts. to Colo. and Kan.; S. to Minn.; S. to Ga. and Miss. in Appalachians.

Minn. valley: Throughout; river banks and shores of lakes.

HERB.: *Sheldon 1292*, Lake Benton; *Ballard 593*, Pri-

or's lake, Scott Co.; *Taylor* 725, Minnesota lake; *Sheldon* 212, Lake Ballentyne, Blue Earth Co.; *Sheldon* 430, Janesville; *Kasube* 56, Minneapolis; *Oestlund* 33, Hennepin Co.; *Herrick* 80, Minneapolis; *Bailey* 186a, Vermilion lake; *Sandberg* 138, Cannon Falls; *Herb. Moyer* 64, Montevideo.

APIOS MOENCH, Meth. 165 (1794).

Cyrtotropis WALL. Pl. As. Rar. I, 49 (1830).

Baillon, *Hist. Pl.* II, 249; Benth. and Hook., *Gen. Pl.* I, 532; Durand, *Ind. Gen. Phan.* 99.

Living species: 3; N. America, China and Himalayas; 1 in each region.

Fossil species: remains of the closely related *Glycine* Linn. distinguished in Tertiary of Kumi (*Unger*); see Schenck *Palaeophyt.* 684.

Apios apios (LINN.) MACM. Torr. Bull. XIX, (1891).

Glycine apios LINN. Spec. 753 (1753).

Apios tuberosa MOENCH, Meth. 165 (1794).

Phaseolus tuberosus EAT. and WR. Man. 354 (1840).

Wats. and Coult., Gray's Man. 6 ed. 144; Britt., Fl. N. J. 89; Webb., Fl. Neb. 130; Chap., Fl. S. St. 105; Upham, Fl. Minn. 47; Mac., Fl. Can. I, 122; Coult., Fl. Tex. 87; Cov., Fl. Ark. 177; Wats., Bibl. Ind. I, 189.

North America: N. S., N. Br., Q., Ont. to N. Eng., N. J., Fla. and Miss.; W. to Minn., Dak., Neb., Kan., Ark. and W. Tex.

Minn. valley: Throughout; low woodland and borders of thickets.

HERB.: *Oestlund* 35, Hennepin Co.; *Sandberg* 142, Red Wing.

VICIA LINN. Gen. 587 (1737).

Ervum LINN. Gen. 588 (1737).

Abacosa, Atossa, Cujunia, Endusa, Hypecusa, Paralloa, Selunia, Swantia, Tuamina, Wiggersia ALEF. Bonplandia and O. Bot. Zsrt. (1858).

Coppolleria TODAR. Pl. Sic. I, 14 (1845).

Cracca RIVIN. T. 52 (1652).

Troillia LINK, ex Baillon, *Hist. Pl.* II, 198 (1870).

Ervum and **Faba** TOURN. Inst. (1700).

Orobella PRESL, Diss. (1832).

Oxypogon RAF. ex Baillon, *Hist. Pl.* II, 198 (1870).

Vicilla SCHUR. ex Baillon, *Hist. Pl.* II, 198 (1870).

Vicioides MOENCH, Meth. 131 (1794).

Baillon, *Hist. Pl.* II, 237; Benth. and Hook., *Gen. Pl.* I, 524; Durand, *Ind. Gen. Phan.* 97; Schenck, *Palaeophyt.* 678.

Living species: 200 described; 100-150 reduced; temperate northern hemisphere and South America; Russia,

45; Europe, 61; Russian Europe, 22; North America, 10-12; Mid. Calif., 6; Canada, 6; S. Sts., 7; Rocky mts., 3; E. Sts., 3; W. Tex., 5; Pl. King., 1; Pl. Wheel., 1.

Fossil species: *Ervites*, (*Saporta*) Tertiary of Aix. Lower Oligocene.

***Vicia americana* MUHL.** Willd. Spec. III, 1096 (1802).

Orobis diffusus NUTT. Fras. Cat. (1813).

Vicia sylvatica NUTT. Gen. II, 97 (1818).

V. tridentata SCHW. Appx. Long. Exp. 116 (1825).

V. sparsifolia and *oregana* NUTT. T. and G. Fl. I, 270 (1838).

Wats. and Coult., Gray's Man. 6 ed. 143; Britt., Fl. N. J. 88; Webb., Fl. Neb. 130; Coult., Fl. Colo. 72; Upham, Fl. Minn. 46; Brew. and Wats., Fl. Calif. I, 157; Mac., Fl. Can. I, 121, 512; Greene, Fl. Fran. 3; Wats., King Exp. 78; Roth., Wheel. Exp. 162 *in var.*; Cov., Fl. Ark. 176; Wats., Bibl. Ind. I, 267.

North America: N. Br., Niagara river, N. of Lake Superior. Brit. Col. to Pac. and Alaska; S. to Washington, Oregon, Calif. and N. Mexico; E. to Minn., Ark., Kan., Neb., Ind., N. Y. and N. J.

Minn. valley: Forest district and W. to Chippewa valley; moist woods and banks.

HERB.: *Ballard* 780, Swan lake, Carver Co.; *Ballard* 472, Prior's lake, Scott Co.; *Ballard* 631, Chaska, Carver Co.; *Ballard* 363, Helena, Scott Co.; *Ballard* 215, Jordan, Scott Co.; *Ballard* 109, Carver; *Ballard* 690, Waconia; *Taylor* 676, Minnesota lake; *Taylor* 270, Janesville; *Taylor* 69, Elysian; *Sheldon* 150, Madison Lake; *Holzinger* 59, Winona Co.; *Holzinger* 60, Winona; *Herrick* 79, Minneapolis; *Hammond* 14, Lake City; *Herb. Sheld.* 1899, Minneapolis; *Herb. Moyer* 63, Black Oak lake, Chippewa Co.

***Vicia caroliniana* WALT.** Fl. Car. 182 (1788).

V. parviflora MICHX. Fl. N. Am. II, 60 (1803).

Cracca caroliniana ALEF. Bonplandia IX, 124 (1861).

Wats. and Coult., Gray's Man. 6 ed. 143; Britt. Fl. N. J. 88; Chap., Fl. S. St. 98; Upham, Fl. Minn. 46; Mac., Fl. Can. I, 120, 512; Cov., Fl. Ark. 176; Wats., Bibl. Ind. I, 268.

North America: Ont. to N. Y. and N. J.; S. to Ga.; W. to Minn., Kan. and Ark.

Minn. valley: N. E. district and probably to Blue Earth Co.; edges of woods and river banks.

HERB.: ?*Kassube* 55, Minnehaha; *Herb. Sheld.* 1898, Minneapolis.

***Vicia cracca* LINN.** Spec. 735 (1753).

Ervum cracca TRAUTV. Fl. Sib. 46 Act. Hort. Petr. V, 1, (1877).

Wats. and Coult., Gray's Man. 6 ed. 143; Britt., Fl. N. J. 88; Upham, Fl. Minn. 46; Hook., Fl. Gt. Brit. 107; Mac., Fl. Can. I, 120; Forbes and Hems., Fl. Sin. 184; Led., Fl. Ross. I, 674; Nym., Fl. Eur.; Miyabe, Fl. Kur. 225; Herd., Fl. Eur. Russ. 42; Wats., Bibl. Ind. I, 268; Hart., Fl. Scand. I, 299.

Arctic Europe; N. and W. Asia; China; N. Africa; Kurile Isls.

North America: Newf. and Greenland; N. S., N. Br., Ont. to N. J.; W. to Minn., Iowa and Ky.

Minn. valley: Reported from N. E. district and E. edge; rare; edges of woods.

LESPEDEZA MICHX. Fl. Bor.-Am. II, 70 (1803).

Oxyramphis WALL. Cat. 5348 (1828).

Campylotropis BUNGE, Ann. Sci. Nat. Ser. 2, VI, 57 (1836).

Phlebesporium JUNGH. Reise 346, Flora, 508 (1847).

Baillon, *Hist. Pl.* II, 318; Benth. and Hook., *Gen. Pl.* I, 524; Durand, *Ind. Gen. Phan.* 97.

Living species: $35 \pm$; N. America, temperate Asia and tropical Australian, mts. Russia, 3; North America, 8-10; E. Sts., 8; S. Sts., 5; Canada, 4; W. Tex, 2.

Lespedeza leptostachya ENGELM. Gray, Proc. Am. Acad. XII, 57 (1876).

Wats. and Coult., Gray's Man. 6 ed. 142, Upham, Fl. Minn. 46; Wats., Bibl. Ind. I, 232.

North America: Ills., Iowa and Minn.

Minn. valley: Reported from S. edge; no Minn. specimens seen.

Lespedeza frutescens (WILLD.) ELL. Sk. II, 206 (1824).

? *Hedysarum umbellatum* WALT. Fl. Car. 184 (1788).

H. frutescens WILLD. Spec. III, 1193 (1802).

Lespedeza capitata MICHX. Fl. Am. II, 71 (1803).

L. fruticosa PERS. Syn. II, 318 (1807).

Wats. and Coult., Gray's Man. 6 ed. 142; Upham, Fl. Minn. 46; Britt., Fl. N. J. 87; Webb., Fl. Neb. 130; Chap., Fl. S. St. 101; Mac., Fl. Can. I, 120, 511; Cov., Fl. Ark. 176; Wats., Bibl. Ind. I, 232.

North America: Ont. and N. Eng. to N. J., Fla., Miss. and La.; W. to Minn., Neb., Mo. and Ark.

Minn. valley: Forest district to New Ulm and Dak. line; dry and sandy places and shores of lakes.

HERB.: Taylor 585, Minnesota lake; Sheldon 1203, New Ulm; Sheldon 1501, Lake Benton; Sandberg 137, Cannon Falls.

Lespedeza hirta (LINN.) ELL. Sk. II, 207 (1824).

Hedysarum hirtum LINN. Spec. 748 (1753).

L. polystacha MICHX. Fl. Am. II, 71 (1803).

Hallia hirta POIR. Suppl. III, 3 (1813).

Wats. and Coult., Gray's Man. 6 ed. 141; Britt., Fl. N. J. 86; Upham, Fl. Minn. 46; Chap., Fl. S. St. 101; Mac., Fl. Can. I, 119; Wats., Bibl. Ind. I, 232.

North America: Ont. to Mass., N. J., Fla. and Miss; W. to Minn.

Minn. valley: Reported from S. W. and S. central districts; wooded hillsides and sunny banks.

Lespedeza reticulata (MUHL.) PERS. Syn. II, 318 (1807).

Hedysarum violaceum LINN. Spec. 749 (1753) *in part*.

H. reticulatum MUHL. Willd.-Spec. III, 1194 (1802).

Lespedeza sessiliflora MICHX. Fl. N. Am. II, 70 (1803) *in part*.

L. violacea var. *sessiliflora* DON, Mill. II, 307 (1832).

? *L. stuvei* var. *intermedia* S. WATS. Wats and Coult., Gray's Man. 6 ed. 141 (1890) *in part*.

Upham, Fl. Minn. 46; Chap., Fl. S. St. 101; Britt., Fl. N. J. 86; Mac., Fl. Can. I, 119, 511; Coult. Fl. Tex. 86; Cov., Fl. Ark. 176; Wats., Bibl. Ind. I, 233.

North America: Ont. and Mass. to Ill., Kan. and Tex?; W. to Minn. and Ark.

Minn. valley: Reported from S. central district; dry woods and edges of thickets.

Lespedeza reticulata (MUHL.) PERS. var. **virginica** (LINN.).

Medicago virginica LINN. Spec. 778 (1753).

Hedysarum junceum WALT. Fl. Car. 185 (1788).

H. reticulatum MUHL. Willd. Spec. III, 1194 (1802) *in part*.

Lespedeza sessiliflora MICHX. Fl. Am. II, 70 (1803) *in part*.

Hallia juncea POIR. Suppl. III, 3, (1813).

Lespedeza frutescens DC. Prodr. II, 349 (1825).

L. angustifolia HOOK. Bot. Mag. I, 23 (1835).

L. violacea var. *angustifolia* MAXIM. Syn. 366 (1837?).

L. reticulata WATS. and COULT. Gray's Man. 6 ed. 141 (1890) *in part*.

Britt., Fl. N. J. 86; Upham, Fl. Minn. 46; Chap., Fl. S. St. 101; Mac., Fl. Can. I, 119?; Wats., Bibl. Ind. I, 233.

North America: Mass. to Minn.; S. to Fla. and La.

Minn. valley: Reported from S. W. and S. central districts; dry woods and thickets.

Lespedeza violacea (LINN.) PERS. Syn. II, 318 (1807).

Hedysarum violaceum LINN. Spec. 749 (1753) *in part*.

H. frutescens LINN. Spec. 749 (1753).

Aeschynomene frutescens POIR. Enc. Meth. IV, 451 (1797).

Lespedeza divergens PURSH, Fl. Am. 481 (1814).

Wats. and Coult., Gray's Man. 6 ed. 141; Upham, Fl. Minn. 46; Britt., Fl. N. J. 86; Chap., Fl. S. St. 100; Cov., Fl. Ark. 176; Wats., Bibl. Ind. I, 233.

North America: N. Eng. and N. J. to Fla., Miss. and La.; W. to Minn. Kan. and Ark.

Minn. valley: Reported from S. central districts; thickets and copses.

Lespedeza repens (LINN.) BART. Prodr. Fl. Phil. II, 77 (1815).

Hedysarum repens LINN. Spec. 749 (1753).

H. prostratum MUHL. Willd. Spec. III, 1200 (1802).

Lespedeza procumbens MICHX. Fl. N. Am. II, 70 (1803).

Hedysarum lespedeza POIR. Enc. Meth. VI, 415 (1804).

Lespedeza prostrata PURSH, Fl. Am. 481 (1814).

Wats. and Coult., Gray's Man. 6 ed. 141; Britt., Fl. N. J. 86; Upham, Fl. Minn. 46; Chap. Fl. S. St. 100; Mac., Fl. Can. I, 119; Coult., Fl. Tex. 86; Cov., Fl. Ark. 176; Wats., Bibl. Ind. I, 232.

North America: Ont., N. Y. and N. Eng. to N. J., Fla. and Miss.; W. to Minn., Ark. and Tex.

Minn. valley: Reported from S. E. district; no Minn. specimens seen; sandy banks and roadsides.

PLEUROLOBUS ST. HIL. ex Kuntze, (1812).

Desmodium DESVX. ex Kuntze, (1813).

Dendrolobium BENTH. Pl. Jungh. I, 215 (1855).

Phyllodium DESVX. Journ. Bot. I, 123 (1813).

Dicerma DC. Mem. Leg. 326 (1825) *p. p.*

Pteroloma BENTH. Pl. Jungh. I, 219 (1855).

Catenaria BENTH. Jungh. I, 220 (1855).

Ototropis NEES, Vrat. Sem. (1838).

Dollinera ENDL. Gen. 1285 (1840).

Cyclomorium WALP. Rep. II, 890 (1843).

Nicolsonia DC. Mem. Leg. 311 (1825).

Perrottetia DC. Ann. Sci. Nat. Ser. 1, IV, 95 (1824).

Sagotia WALP. Linn. XXIII, 737 (1849).

Oxydium BENN. Pl. Jav. 156 (1838).

Codariocalyx HASSK. B b. Flora II, 48 (1842).

Baillon, *Hist. Pl.* II, 313; Benth. and Hook., *Gen. Pl.* I, 519; Durand, *Ind. Gen. Phan.* 96; O. Kuntze, *Rev. Gen.* I, 195.

Living species: 155±; N. and S. America; Africa; warmer Asia and Australasia. North America, 35; Canada, 10; E. Sts., 20; S. Sts., 20; Pl. Wheel., 6.

Pleurolobus canadensis (LINN.).

Hedysarum canadense LINN. Spec. 748 (1753).

H. scabrum MOENCH, Meth. 118 (1794).

Desmodium canadense DC. Prodr. II, 328 (1825).

Meibomia canadensis OK. Rev. Gen. I, 195 (1891).

Wats. and Coult., Gray's Man. 6 ed. 140; Britt., Fl. N. J. 85; Webb., Fl. Neb. 130; Chap., Fl. S. St. 103; Upham, Fl. Minn. 45; Mac., Fl. Can. I, 119; Cov., Fl. Ark. 175; Wats., Bibl. Ind. I, 215.

North America: N. Br., Q., Ont. to Man.; S. to N. J. and N. Car.; W. to Minn. and Neb.

Minn. valley: Throughout, forest districts and banks of streams; rare W. of Chippewa valley; dry woods and thickets.

HERB.: *Taylor* 555, Minnesota lake; *Ballard* 533, Cleary's lake, Scott Co.; *Sheldon* 646, Waseca; *Ballard* 647, Chaska; *Sheldon* 1116, Springfield; *Taylor* 767, Glenwood; *Ballard* 787, Swan lake, Carver Co.; *Taylor* 768, Glenwood; *Sheldon* 1321, Lake Benton; *Sheldon* 1110, New Ulm; *Ballard* 459, Prior's lake, Scott Co.; *Taylor* 722, Minnesota lake; *Sheldon* 772, Sleepy Eye; *Oestlund* 32, Hennepin Co.; *Sandberg* 136, Goodhue Co.; *Herrick* 78, Minneapolis; *Herb. Moyer* 62, Montevideo.

***Pleurolobus paniculatus* (LINN.).**

Hedysarum paniculatum LINN. Spec. 748 (1753).

Desmodium paniculatum DC. Prodr. II, 329 (1825).

Meibomia paniculata OK. Rev. Gen. I, 198 (1891).

Wats. and Coult., Gray's Man. 6 ed. 140; Britt., Fl. N. J. 85; Webb., Fl. Neb. 130; Upham, Fl. Minn. 45; Chap., Fl. S. St. 103; Mac., Fl. Can. I, 119; Coult., Fl. Tex. 85; Cov., Fl. Ark. 176; Wats., Bibl. Ind. I, 217.

North America: Ont., N. Eng.; N. J. to Fla. and Miss.; W. to Minn., Neb., Dak., Ark. and Tex.

Minn. valley: S. E. districts and Ft. Snelling; thickets and edges of forests; rare.

HERB.: *Holzinger* 58, Winona Co.

***Pleurolobus dillenii* (DARL.).**

Desmodium dillenii DARL. Fl. Cestr. 414 (1827).

Hedysarum marylandicum WILLD. Spec. III, 1189 (1802) not Linn.

Desmodium marylandicum DC. Prodr. II, 328 (1825).

D. boottii TORR. Curt. Enum. Wilm. (1834).

Meibomia dillenii OK. Rev. Gen. I, 195 (1891).

Wats. and Coult., Gray's Man. 6 ed. 140; Webb., Fl. Neb. 130; Britt., Fl. N. J. 85; Chap., Fl. S. St. 103; Upham, Fl. Minn. 45; Mac., Fl. Can. I, 118; Cov., Fl. Ark. 176; Wats., Bibl. Ind. I, 216.

North America: Ont. to N. Eng., N. J. and Fla.; W. to Minn., Neb. and Ark.

Minn. valley: N. edge of valley and infrequent; forest openings and edges of thickets.

HERB.: ? *Kassube* 54, Minneapolis.

***Pleurolobus canescens* (LINN.).**

Hedysarum canescens LINN. Spec. 748 (1753) part.

H. viridiflorum WILLD. Spec. III, 1192 (1802).

H. scaberrimum ELL. Sk. II, 217 (1824).

Desmodium canescens DC. Prodr. II, 328 (1825).

D. viridiflorum DC. Prodr. II, 329 (1825) excl. syn.

D. aikinianum BECK, Bot. 84 (1833).

Hedysarum aikinii EATON, Man. ed. VII, 325 (1836).

Meibomia canescens OK. Rev. Gen. I, 195 (1891).

Wats. and Coult., Gray's Man. 6 ed. 139; Britt., Fl. N. J. 84; Webb., Fl. Neb. 130; Chap., Fl. S. St., 102; Upham, Fl. Minn. 45; Mac., Fl. Can. I, 118; II, 317; Cov., Fl. Ark. 175; Wats., Bibl. Ind. I, 215.

North America: Ont. to Mass. and Vt.; S. to N. J., Fla. and Miss.; W. to Minn., Neb. and Ark.

Minn. valley: Forest district to Nicollet Co. and New Ulm; infrequent; rich woods and damp edges of meadows.

HERB.: *Ballard* 696, Waconia; *Ballard* 554, Spring lake, Scott Co.; *Sandberg* 135, Cannon Falls.

***Pleurolobus grandiflorus* (WALT.).**

Hedysarum grandiflorum WALT. Fl. Car. 185 (1788).

H. glutinosum WILLD. Spec. III, 1198 (1802).

H. acuminatum MICHX. Fl. Am. II, 72 (1803).

Desmodium acuminatum DC. Prodr. II, 329 (1825).

D. grandiflorum DC. Prodr. II, 338 (1825).

Meibomia grandiflora OK. Rev. Gen. I, 196 (1891).

Wats. and Coult., Gray's Man. 6 ed. 139; Webb., Fl. Neb. 130; Britt., Fl. N. J. 84; Upham, Fl. Minn. 45; Chap., Fl. S. St. 102; Mac., Fl. Can. I, 118; Cov., Fl. Ark. 176; Wats., Bibl. Ind. I, 215.

North America: Q., Ont., N. Eng., N. J. to Fla., Miss. and Alab.; W. to Minn., Neb., Ark. and Tex.

Minn. valley: Forest district and banks of streams to Chippewa valley; moist woods and near lakes.

HERB.: *Ballard* 770, Swan lake, Carver Co.; *Ballard* 74, Chaska; *Ballard* 685, Waconia; *Taylor* 807, Glenwood; *Taylor* 611, Minnesota lake; *Sheldon* 889, Sleepy Eye; *Ballard* 393, Jordan, Scott Co.; *Ballard* 595, Prior's lake, Scott Co.; *Ballard* 686, Waconia; *Ballard* 352, Helena, Scott Co.; *Ballard* 473, Prior's lake, Scott Co.; *Leonard* 13, Spring Valley; *Herrick* 77, Minneapolis; *Oestlund* 31, Hennepin Co., *Sandberg* 134, Cannon Falls; *Herb. Sheld.* 1747, Minneapolis.

***Pleurolobus nudiflorus* (LINN.).**

Hedysarum nudiflorum LINN. Spec. 749 (1753).

Desmodium nudiflorum DC. Prodr. II, 330 (1825).

Meibomia nudiflora OK. Rev. Gen. I, 197 (1891).

Wats. and Coult., Gray's Man. 6 ed. 138; Britt., Fl. N. J. 84; Upham, Fl. Minn. 45; Chap., Fl. S. St. 102; Mac., Fl. Can. I, 118; Cov., Fl. Ark. 176; Wats., Bibl. Ind. I, 217.

North America: Q., Ont., N. Eng., N. J. to Fla. and Miss.; W. to Minn. and Ark.

Minn. valley: Reported from S. central district; dry banks and woods.

GLYCYRRHIZA LINN. Gen. Corr. 973 (1737).*Liquiritia* MOENCH, Meth. 152 (1794).*Clidanthera* R. BR. App. Sturt. Exp. 10 (1820?).*Meristotrophis* F. and M. Ind. Sem. Petrop. IX, 25 (1842).*Glycyrrhizopsis* BOISS. Diagn. Or. Ser. 2, V, 82 (1860?).Baillon, *Hist. Pl.* II, 282; Benth. and Hook., *Gen. Pl.* I, 508; Durand, *Ind. Gen. Phan.* 95; Schenck, *Palaeophyt.* 680.

Living species: 12; temperate and subtropical Asia; Mediterranean region; W. N. and S. America; Australia. Russia, 5; Russian Europe, 3; North America, 2; E. Sts., 1; Calif., 1; centers around the Mediterranean.

Fossil species: 1-2; Europe, Tertiary (*Heer, Unger*).

Glycyrrhiza lepidota (NUTT.) PURSH, Fl. Am. 480 (1814).*Liquiritia lepidota* NUTT. Fras. Cat. (1813).*Glycyrrhiza glabra* TORR. Em. Rep. 408 (1858).

Wats. and Coult., Gray's Man. 6 ed. 137; Coult., Fl. Colo. 59; Webb., Fl. Neb. 130; Upham, Fl. Minn. 45; Brew. and Wats., Fl. Calif. I, 143; Mac., Fl. Can. I, 109; Coult., Fl. Tex. 84; Wats., King Exp. 78; Roth., Wheel. Exp. 98; Cov., Fl. Ark. 175; Wats., Bibl. Ind. I, 222.

North America: Lake Erie reg. of Can. to Saskatchewan, Assiniboia and Rockies; N. to Hudson Bay; S. to Washington, Calif. and Neb.; in mts. to N. Mexico; E. to Tex., Colo., Neb., Iowa, Mo., Ark. and Minn.

Minn. valley: Throughout; especially in prairie districts; sandy shores of lakes and high prairies.

HERB.: *Taylor* 684, Minnesota lake; *Sheldon* 1272, Lake Benton; *Sheldon* 773, Sleepy Eye; *Taylor* 1120, Glenwood; *Taylor* 775, Glenwood; *Sheldon* 1453, Pipestone City; *Herrick* 76, Minneapolis; *Kassube* 53, Minneapolis; *Herb. Moyer* 60, Montevideo.

SPIESIA NECK. Elem. 1311 (1790).*Oxytropis* DC. Astrag. 24, 66 (1802).

Baillon, *Hist. Pl.* II, 281; Benth. and Hook., *Gen. Pl.* I, 507; Durand, *Ind. Gen. Phan.* 95; O. Kuntze, *Rev. Gen.* I, 205.

Living species: 200±; Europe; Asia; North America; mountainous and colder regions. Russia, 75; Europe, 12; Russian Europe, 11; North America, 14; Canada, 12-13; Rocky mts., 11-12; E. Sts., 3; Pl. King, 1; Pl. Wheel., 5; W. Tex., 1.

Spiesia splendens (DOUGL.) O. KUNTZE, *Rev. Gen. Pl.* I, 207 (1891).

Oxytropis splendens DOUGL. Hook. Fl. Bor.-Am. I, 147 (1833).

Wats. and Coult., Gray's Man. 6 ed. 137; Coult., Fl. Colo. 70; Upham, Fl. Minn. 45; Mac., Fl. Can. I, 116, 510; Roth., Wheel. Exp. 97; Wats., King Exp. 447; Wats., Bibl. Ind. I, 246.

North America; Red valley to N. W. T. and 51° N. lat.; Saskatchewan and W. Minn. to Rocky mts. and N. Tex.

Minn. valley: Reported from Chippewa river and Glenwood; W. to Dakota line; high bluffs and prairies.

Spiesia lamberti (PURSH) O. KUNTZE, *Rev. Gen. Pl. I*, 207 (1891).

Oxytropis lamberti PURSH, *Fl. Am* 740 (1814).

Astragalus lamberti POIR. *Suppl. V*, 564 (1817).

Oxytropis hookeriana NUTT. *T. and G. Fl. I*, 340 (1838).

Wats. and Coult., *Gray's Man.* 6 ed. 137; Webb., *Fl. Neb.* 130; Coult., *Fl. Colo.* 71; Upham, *Fl. Minn.* 44; Mac., *Fl. Can. I*, 116; Coult., *Fl. Tex.* 84; Roth., *Wheel. Exp.* 42, 97; Wats., *King Exp.* 447; Wats., *Bibl. Ind. I*, 245.

North America: Red valley and N. W. T. to Alaska; Saskatchewan, Minn., N. Mex. and Tex.; W. to Rocky mts.

Minn. valley: Prairie district, E. to New Ulm; high, bare bluffs and prairies.

HERB.: *Sheldon* 1337, Lake Benton; *Sheldon* 1389, Verdi, Lincoln Co.; *Taylor* 832, Glenwood; *Taylor* 873, Glenwood; *Roberts* 25, Hancock; *Leiberg* 16, Rock Co.; *Herb. Wickersheim* 32, Idlewild, Lincoln Co.

ASTRAGALUS LINN. *Gen.* 570 (1737).

Phaca LINN. *Gen. Corr.* 972 (1737).

Homolobus and **Kentrophyta** NUTT. *T. and G. Fl. N. Am. I*, 350, 353 (1838).

Diplothea HOCHST, *Flora* 595 (1846).

Aulosema WALP. *Rep. I*, 694 (1842).

Podolotus ROYLE, *Ill. Him.* 198 (1839).

Tragacantha TOURN. *Inst.* 417 (1700).

Erophaca BOISS. *Voy. Bot.* 176 (1839).

Baillon, *Hist. Pl.* II, 280; Benth. and Hook., *Gen. Pl. I*, 506; Durand, *Ind. Gen. Phan.* 94; O. Kuntze, *Rev. Gen. I*, 210.

Living species: 1300 described; 900± distinct. Center in Russian Asia, Himalayas and the Orient; Europe, North and South America, S. E. Africa (1 sp.); wanting in Australia and Cape of Good Hope region. Especially in northern hemisphere; Russia, 175; Europe, 125; Russian Europe, 52; North America, 150+; Mid. Calif., 36; W. Tex., 19; all Calif., 50±; Canada, 42; E. Sts., 16; S. Sts., 6; Rocky mts., 66; Pl. King, 40; Pl. Wheel., 30.

Astragalus lotiflorus HOOK. *Fl. Bor.-Am. I*, 152 (1833).

Phaca lotiflora T. and G. *Fl. I*, 349 (1838).

Wats. and Coult., *Gray's Man.* 6 ed. 136; Wats., *King Exp.* 439; Roth., *Wheel. Exp.* 36; Wats., *Bibl. Ind. I*, 196; Webb., *Fl. Neb.* 131; Coult., *Fl. Colo.* 63; Mac., *Fl. Can. I*, 112.

North America: Saskatchewan and Brit. Col. to Minn., Dak., Wyoming, Neb., Kan., Ind. Terr. and Tex.

Minn. valley: Local near mouth of Chippewa; high plains or knolls.

HERB.: *Moyer* 257, Montevideo; *Herb. Moyer* 258, Montevideo.

Astragalus flexuosus DOUGL. Hook. Fl. N. Am. I. 140 (1833).

Phaca flexuosa HOOK. Fl. N. Am. I, 140 (1833).

P. elongata HOOK. l. c. (1833).

Wats. and Coult., Gray's Man. 6 ed. 137; Mac., Fl. Can. I, 113; Wats., King Exp. 443; Wats., Bibl. Ind. I, 193; Upham, Fl. Minn. 44; Webb., Fl. Neb. 131; Coult., Fl. Colo. 67.

North America: Saskatchewan, Brit. Col., N. W. T., Assiniboia and lat. 50° N. to Minn., Dak., Neb. and Wyoming.

Minn. valley: Local near mouth of Chippewa; probably rare along W. edge; prairies.

HERB.: *Moyer* 254, Montevideo; *Herb. Moyer* 255, Montevideo.

Astragalus hypoglottis LINN. Mant. II, 274 (1771).

A. agrestis DOUGL. Hook. Fl. ? (1833).

A. goniatus NUTT. T. and G. Fl. I, 330 (1838).

Phaca hypoglottis MACM. MSS. (1891).

Wats. and Coult., Gray's Man. 6 ed. 135; Wats., King Exp. 68, 436; Roth., Fl. Alask. 445; Wats., Bibl. Ind. I, 195; Led., Fl. Ross. I, 602; Mac., Fl. Can. I, 111; Webb., Fl. Neb. 131; Upham, Fl. Minn. 44; Coult., Fl. Colo. 61.

Siberia and Kamtschatka.

North America: Hudson Bay and Alaska to S. Colo. and Neb.

Minn. valley: Chippewa valley, Glenwood to Montevideo and probably along W. edge; prairies.

HERB.: *Taylor* 743, Glenwood; *Moyer* 252, Montevideo; *Herb. Moyer* 253, Montevideo.

Astragalus adsurgens PALL. Astrag. 40 (1800).

A. laxmanni NUTT. Gen. II, 99 (1818).

A. striatus NUTT. in T. and G. Fl. I, 330 (1838).

Wats. and Coult., Gray's Man., 6 ed. 135; Upham, Fl. Minn. 44; Webb., Fl. Neb. 131; Mac., Fl. Can. I, 110; Led., Fl. Ross. I, 603; Wats., King Exp. 68, 439; Roth., Wheel. Exp. 36; Coult., Fl. Colo. 61.

Siberia and Kamtschatka.

North America: Nelson river, lat. 56° N., Saskatchewan and Assiniboia to Minn., Neb., Brit. Colo. and Oregon.

Minn. valley: W. districts and E. to Chippewa valley; prairies and dry sunny banks.

HERB.: *Taylor* 872, Glenwood; *Sheldon* 1381, Lake Benton; *Taylor* 743, Glenwood; *Moyer* 1, Montevideo; ?*Moyer* 2, Montevideo; *Holzinger* 298, Hancock.

***Astragalus parviflorus* (PURSH).**

Dalea parviflorus PURSH, Fl. Am. 474 (1814).

Psoralea parviflora POIR. Suppl. IV, 590 (1816).

Astragalus gracilis NUTT. Gen. II, 100 (1818).

Phaca parviflora NUTT. T. and G. Fl. I, 348 (1838).

P. gracilis MACM. MSS. (1891).

Wats. and Coult., Gray's Man. 6 ed. 136; Webb., Fl. Neb. 131; Coult., Fl. Colo. 62; Upham, Fl. Minn. 44; Wats., King Exp. 438; Roth., Wheel Exp. 94; Wats., Bibl. Ind. I, 194.

North America: Colo. to Neb., Mo. and Minn.

Minn. valley: Reported from the S. W. district; prairies.

***Astragalus canadensis* LINN. Spec. 757 (1753).**

A. carolinianus LINN. Spec. 757 (1753).

Phaca canadensis MACM. MSS. (1891).

Wats. and Coult., Gray's Man. 6 ed. 135; Coult., Fl. Colo. 61; Webb., Fl. Neb. 131; Upham, Fl. Minn. 43; Chap., Fl. S. St. 97; Mac., Fl. Can. I, 110, 507; Wats., King Exp. 67, 68, 436; Roth., Wheel. Exp. 93; Cov., Fl. Ark. 175; Wats., Bibl. Ind. I, 191.

North America, Q., Ont., Hudson Bay and Rocky mts. to N. Y., Ga. and Fla.; W. to headwaters of the Columbia river and the Saskatchewan; S. in mts. to Gt. Basin region; through Colo., Minn., Neb., Kan. and Ark.

Minn. valley: Throughout; river banks, lake shores and sandy prairies.

HERB.: *Taylor* 685, Minnesota lake; *Taylor* 751, Minnesota lake; *Ballard* 488, Prior's lake, Scott Co.; *Sheldon* 1587, Lake Benton; *Taylor* 912, Glenwood; *Ballard* 767, Waconia; *Kassube* 52, Minneapolis; *Herrick* 75, Minneapolis; *Sandberg* 133, Goodhue Co.; *Holzinger* 56, Winona Co.; *Holzinger* 57, Winona Co.; *Herb. Sheld.* 1746, Minneapolis; *Herb. Moyer* 59, Montevideo; *Pomeroy* 2, Hennepin Co.; *Holtz* 15, Hennepin Co.

***Astragalus plattensis* NUTT. T. and G. Fl. I, 332 (1838).**

A. mexicanus GRAY, Pl. LINDH. 176 (1845).

A. tennesseensis GRAY, Chap. Fl. S. St. 98 (1860).

A. plattensis var. *tennesseensis* GRAY, Proc. Am. Acad. VI, 193 (1863).

Phaca plattensis MACM. MSS. (1891).

Wats. and Coult., Gray's Man. 6 ed. 135; Webb., Fl. Neb. 131; Coult., Fl. Colo. 60; Chap., Fl. S. St. 98; Upham, Fl. Minn. 43; Coult., Fl. Tex. 82; Wats., King. Exp. 435; Wats., Bibl. Ind. I, 199.

North America: Minn. and Dak. to Colo., Neb., Ill., Alab. and N. Mex.

Minn. valley: Reported from S. W. district; prairies.

Astragalus caryocarpus KER. Bot. Reg. II, 176 (1816).*A. crassicaarpus* NUTT. Fras. Cat. (1813).*A. carnosus* PURSH, Fl. Am. 740 (1814).*A. succulentus* RICH. Frankl. Journ. 18 (1823).*A. pachycarpus* T. and G. Fl. I, 332 (1838).*Phaca caryocarpa* MACM. MSS. (1891).

Wats., and Coult., Gray's Man. 6 ed. 135; Coult., Fl. Colo. 60; Webb., Fl. Neb. 131; Upham, Fl. Minn. 43; Mac., Fl. Can. I, 110; Coult., Fl. Tex. 82; Wats., King Exp. 435; Roth., Wheel. Exp. 93; Cov., Fl. Ark. 175; Wats., Bibl. Ind. I, 191.

North America: Saskatchewan valley to S. W. Tex.; from Colo. to Minn., Neb. and Iowa; prairies.

Minn. valley: Throughout, prairies and forest openings.

HERB.: *Ballard* 341, Jordan, Scott Co.; *Sheldon* 1608, Minneapolis; *Kassube* 51, Minneapolis; *Ankeny* 1, Minneapolis; *Sandberg* 132, Red Wing; *Herb. Sheld.* 1897, Minneapolis; *Herb. Wickersheim* 31, Idlewild, Lincoln Co.; *Herb. Moyer* 58, Montevideo; *Clark* 1, Hennepin Co.; *Seward* 1, Hennepin Co.; *Pomeroy* 1, Hennepin Co.; *Cross* 1, Hennepin Co.

AMORPHA LINN. Gen. 604 (1737).**Bonafidia** NECK. Elem. 1364 (1790).

Baillon, *Hist. Pl.* II, 287; Benth. and Hook., *Gen. Pl.* I, 492; Durand, *Ind. Gen. Phan.* 92; Schenck, *Palaeophyt.* 680.

Living species: 8; North America especially in southwest. 1 sp. introd. in Russia. Canada, 3; W. Tex., 3; Mid. Calif., 2; E. Sts., 3; Rocky mts., 3; S. Sts., 3; Pl. Wheel., 2.

Fossil species: European Tertiary 1, doubtful (*Unger*).

Amorpha canescens NUTT. Fras. Cat. (1813).

Wats. and Coult., Gray's Man. 6 ed. 131; Coult., Fl. Colo. 59; Webb., Fl. Neb. 132; Upham, Fl. Minn. 43; Chap., Fl. S. St., 94; Mac., Fl. Can. I, 108, 506; Cov., Fl. Ark. 174; Wats., Bibl. Ind. I, 187.

North America: Man. and Red river reg. to 60° N. lat.; S. to Minn., Colo., Ark. and Tex. E. to Ind. and Ga.

Minn. valley: Throughout; prairies and higher levels; especially abundant in prairie district.

HERB.: *Taylor* 686, Minnesota lake; *Sheldon* 531, Waseca; *Sheldon* 670, Waseca; *Taylor* 758, Glenwood; *Ballard* 256, Jordan, Scott Co.; *Taylor* 590, Minnesota lake; *Sheldon* 1103, Springfield; *Winchell* 4, Minneapolis; *Kassube* 50, Minneapolis; *Holzinger* 55, Winona Co.; *Oestlund* 30, Minneapolis; *Herrick*, 74, Minneapolis; *Leonard* 12, Minneapolis; *Sandberg* 130, Goodhue Co.; *Sheldon* 783, Sleepy Eye; *Herb. Sheld.* 1651, Minneapolis; *Herb. Moyer* 57, Montevideo.

Amorpha microphylla PURSH, Fl. Am. 466 (1814).*A. nana* NUTT. Gen. II, 91 (1818).

Wats. and Coult., Gray's Man. 6 ed. 131; Coult., Fl. Colo. 59; Upham, Fl. Minn. 43; Mac., Fl. Can. I, 109, 506; Wats., Bibl. Ind. I, 188.

North America: Assiniboia and Man. to lat. 50° N. on Red river; S. to Minn., Iowa and Rocky mts. Apparently absent or rare in Nebraska where it should be expected.

Minn. valley: Blue Earth Co. and W.; entire prairie district; particularly abundant in Chippewa and Cottonwood valleys; dry prairies and forest openings.

HERB.: *Sheldon 951*, Redwood Falls; *Sheldon 1085*, Springfield; *Herb. Moyer 61*, Montevideo; *MacM. and Sheld. 120*, Brainerd.

Amorpha fruticosa LINN. Spec. 713 (1753).

Wats. and Coult., Gray's Man. 6 ed. 132, Britt., Fl. N. J. 82; Webb., Fl. Neb. 132; Upham, Fl. Minn. 43; Coult., Fl. Colo. 59; Chap., Fl. S. St. 93; Mac., Fl. Can. I, 109; Herd., Fl. Russ. Eur. 44; Coult., Fl. Tex. 76; Roth., Wheel. Exp. 99; Cov., Fl. Ark. 174; Wats., Bibl. Ind. I, 187.

Introduced in European Russia.

North America: Man. to the Selkirks and N. on Red river to Hudson Bay; S. to Colo., Neb., Ark. and Tex.; E. to Penn., N. J., Fla. and Miss.

Minn. valley: Throughout; banks of streams and lakes.

HERB.: *Taylor 36*, Elysian; *Ballard 20*, Chaska; *Sheldon 58*, Elysian; *Kassube 49*, Minneapolis; *Sandberg 129*, Cannon Falls; *Sheldon 1450*, Pipestone; *Sheldon 1273*, Lake Benton; *Sheldon 220*, Madison Lake, Blue Earth Co.; *Herb. Wickersheim 30*, Ash lake, Lincoln Co.; *Herb. Moyer 56*, Montevideo.

Mr. E. P. Sheldon finds that the sectional division of *Amorpha*, on the basis of the number of seeds in the pod, given by Watson and Coulter does not hold good for Minn. valley specimens of *A. fruticosa* which are very frequently only one-seeded.

CRACCA LINN. Fl. Zeyl. 139 (1747).

Tephrosia PERS. Syn. II, 328 (1807).

Brissonia NECK. Elem. 1348 (1790).

Rienera MOENCH, Suppl. 44 (1802).

Xiphocarpus PRESL, Symb. I, 13 (1832).

Kiesera REINW. Syll. Ratisb. II, 11 (1823?).

Requienia DC. Ann. Sci. Nat. Ser. 1, IV. 91 (1824).

Apodynomene E. MEY. Comm. Pl. Afr. 111 (1837).

Pogonostigma BOISS. Diagn. Or. II, 39 (1843).

Catacline EDGEW. Journ. Beng. Soc. XVI, 1214 (1847).

Balboa LIEBM. Vid. Medd. 106 (1856.)

Macronyx DALZ. Hook. Journ. Bot. II, 35 (1835).

Baillon, *Hist. Pl.* II, 264; Benth. and Hook., *Gen. Pl.* I, 496; Durand, *Ind. Gen. Phan.* 93; O. Kuntze, *Rev. Gen.* I, 173; Schenck, *Palaeophyt.* 680.

Living species: $125 \pm$; tropical and subtropical regions. Centers in S. Africa and Australia. North America, 11-13; S. Sts., 8; Canada, 2; E. Sts., 3; Pl. Wheel, 4; W. Tex., 1.

Fossil species: 1; Oeningen, Tertiary (*Heer*).

Cracca virginiana (LINN.) O. KUNTZE, *Rev. Gen. Pl.* I, 173 (1891).

Galega virginiana LINN. Spec. ed. 2, 1062 (1762).

Tephrosia virginiana PERS. Syn. II, 329 (1807).

Wats. and Coult., Gray's Man. 6 ed. 133; Britt., Fl. N. J. 82; Chap., Fl. S. St. 95; Upham, Fl. Minn. 43; Mac., Fl. Can. I, 507; Cov., Fl. Ark. 175; Wats., Bibl. Ind. I, 260.

North America: S. Ont. to Minn. and N. J.; S. to Fla., Miss. and Ark.

Minn. valley: Reported from S. E. edge; no Minnesota plants seen.

KUHNISTERA LAM. Enc. Meth. III, 370 (1789).

Petalostemon MICHX. Fl. Bor.-Am. II, 48 (1803).

(*Kuhnia*) WALT. Fl. Car. (1788).

Cylipogon RAF. Jour. Phys. LXXXIX, 97 (1819) *part.*

Gatesia BERTOL. Misc. VII, 30 (1846).

Baillon, *Hist. Pl.* II, 286; Benth. and Hook., *Gen. Pl.* I, 493; Durand, *Ind. Gen. Phan.* 92; O. Kuntze, *Rev. Gen.* I, 192.

Living species: $25 \pm$; North America and N. Mexico; S. Sts., 9; W. Tex., 8; E. Sts., 5; Canada, 2; Rocky mts., 4; Pl. Wheel., 2.

Kuhnistera villosa (NUTT.) O. KUNTZE, *Rev. Gen. Pl.* I, 192 (1891).

Petalostemon villosus NUTT. Gen. II, 85 (1818).

Dalea villosa SPRENG. Syst. III, 326 (1826).

Wats. and Coult., Gray's Man. 6 ed. 133; Coult., Fl. Colo. 59; Webb., Fl. Neb. 132; Upham, Fl. Minn. 43; Wats., Bibl. Ind. I, 248.

North America: Upper Missouri valley to Neb.; Upper Mississippi to Wisc., Minn. and Mo.

Minn. valley: E. districts to Chippewa valley and Lac Que Parle Co.; more abundant in N. E. and S. E.; dry plains.

HERB.: *Sheldon* 1602, Minneapolis; *Herrick* 73, Minneapolis; *Sandberg* 128, Cannon Falls.

Kuhnistera candida (WILLD.) O. KUNTZE, *Rev. Gen. Pl.* I, 192 (1891).

Dalea candida WILLD. Spec. III, 1337 (1802).

Petalostemon candidus MICHX. Fl. Am. II, 49 (1803).

Psoralea candida POIR. Enc. Meth. V, 694 (1804).

Petalostemon virgatum NEES, Pl. Neuwied 6 (1845?).

Wats. and Coult., Gray's Man. 6 ed. 133; Coult., Fl. Colo. 58; Webb., Fl. Neb. 132; Upham, Fl. Minn. 43; Mac., Fl. Can. I, 109; Coult., Fl. Tex. 79; Roth., Wheel. Exp. 99; Cov., Fl. Ark. 174; Wats., Bibl. Ind. I, 247.

North America: With *K. purpurea* (Vent.).

Minn. valley: Throughout; dry prairies and forest openings and meadows.

HERB.: *Ballard* 633, Chaska; *Sheldon* 1327, Lake Benton; *Sheldon* 1128, Springfield; *Sheldon* 738 Sigel township, Brown Co.; *Taylor* 770, Glenwood; *Oestlund* 29, Minneapolis; *Holzinger* 54, Winona Co.; *Leonard* 11, Minneapolis; *Kassube* 48, Minneapolis; *Herb. Moyer* 55, Montevideo.

Kuhnistera purpurea (VENT.).

Dalea purpurea VENT. Hort. Cels. 40 (1800).

D. violacea WILLD. Spec. III, 1337 (1802).

Petalostemon violaceus MICHX. Fl. Am. II, 50 (1803).

Psoralea purpurea POIR. Enc. Meth. V, 694 (1804).

Wats. and Coult., Gray's Man. 6 ed. 132; Coult., Fl. Colo. 58; Webb., Fl. Neb. 132; Upham, Fl. Minn. 42; Mac., Fl. Can. I, 109; and 507 in var.; Coult., Fl. Tex. 79; Cov., Fl. Ark. 175; Wats., Bibl. Ind. I, 249.

North America: Saskatchewan and N. W. T. to Tex.; W. to Colo. and E. to Indiana; prairies.

Minn. valley: Throughout; dry prairies and forest openings and meadows.

HERB.: *Taylor* 688, Minnesota lake; *Taylor* 835, Glenwood; *Taylor* 183, Janesville; *Sheldon* 1127, Springfield; *Sheldon* 694, Waseca; *Sheldon* 972, Sleepy Eye; *Taylor* 559, Minnesota lake; *Sheldon* 1372, Lake Benton—(a low form with globose heads)—; *Herrick* 72, Minneapolis; *Leonard* 10, Minneapolis; *Holzinger* 53, Winona Co.; *Winchell* 3, Minneapolis; *Kassube* 47, Minneapolis; *Sandberg* 127, Cannon Falls; *Herb. Moyer* 54, Montevideo.

DALEA LINN. Gen. Appx. (1737).

Cylipogon RAF. ex Endl. Gen. 6523 (1840).

Parosella CAV. Elench. Hort. Matr. (1801).

Trichopodium PRESL, Bot. Bem. 52 (1844).

Baillon, *Hist. Pl.* II, 285; Benth. and Hook. *Gen. Pl.* I, 493; Durand, *Ind. Gen. Phan.* 92.

Living species: 110±; N., C. and S. America; especially in the tropics; Mexico and C. Amer. 50±; S. America, 12–16; N. America, 40±; W. Tex., 18; California, 11–15; Rocky mts., 7; S. Sts., 2; E. Sts., 4; Pl. King., 5; Pl. Wheel., 6

Dalea dalea (LINN.) MacM. Torr. Bull. XIX (1891).

Psoralea dalea LINN. Spec. 764 (1753).

Dalea alopecuroides and *cliffortiana* WILLD. Spec. III, 1336 (1803).

D. linnaei MICHX. Fl. N. Am. II, 57 (1803).

Psoralea alopecuroides POIR. Enc. Meth. V, 695 (1804).

Petalostemon alopecuroides PERS. Syn. II, 268 (1807).

Dalea pedunculata PURSH, Fl. Am. 474 (1814).

Wats. and Coult., Gray's Man. 6 ed. 132; Upham, Fl. Minn. 42; Webb., Fl. Neb. 132; Coult., Fl. Colo. 58; Chap., Fl. S. St. 93; Fl. Tex. 77; Roth., Wheel. Exp. 99; Cov., Fl. Ark. 174; Wats., Bibl. Ind. I, 211.

North America: Minn. and Dak. to Ill., Neb., Ark., Ala. and Tex.; W. to Rocky mts. from Mont. to S. Arizona and Pecos river valley.

Minn. valley: Minnesota lake, westward to Dak. line; rich soil along streams.

HERB.: *Sheldon 1455*, Lake Benton; *Taylor 714*, Minnesota lake.

PSORALEA LINN. Gen. ed. II, 716 (1742).

Rhyncodium PRESL, Bot. Bem. 54 (1844).

Meladenia TURCZ. Bull. Mosc. I, 576 (1848).

Dorynchium MOENCH, Meth. 253 (1794).

Ruteria MOENCH, l. c. (1794).

Poikadenia ELL. Sk. II, 198 (1824).

Bipontinia ALEF. Jahresb. Pollich. (1866).

Munbya POMEL, ex Durand, Ind. Phan. (1888).

Lotodes SIEGESB. Fl. Petrop. 66 (1736).

Baillon, *Hist. Pl.* II, 284; Benth. and Hook., *Gen. Pl.* I. 491; Durand, *Ind. Gen. Phan.* 92.

Living species: 100+; 40, S. Africa; 30, N. America; 11, Australia; 6, S. America; 10, trop. and temp. Europe, Asia and N. Africa. (B. and H.); W. Tex., 8; Calif., 6-7; E. Sts., 10; Rocky mts. 8; S. Sts., 7; Pl. King., 1; Pl. Wheel., 2; Canada, 4; mid. Calif. 5.

Psoralea tenuiflora PURSH, Fl. Am. 475 (1814).

P. floribunda NUTT. T. and G. Fl. I, 300, 688 (1838).

Lotodes tenuiflora OK. Gen. I, (1891).

Wats. and Coult., Gray's Man. 6 ed. 131; Upham, Fl. Minn. 42; Webb., Fl. Neb. 132; Coult., Fl. Colo. 56; Fl. Tex. 75; Roth., Wheel. Exp. 98; Cov., Fl. Ark. 174; Wats., Bibl. Ind. I, 254.

North America: Upper Missouri valley to Tex. and Arizona; E. to Minn., Neb., Iowa, Kan., Ark. and Ill.

Minn. valley: Reported from prairies of Cottonwood Co. and along the Watonwan valley; hillsides and dry prairies.

Psoralea esculenta PURSH, Fl. Am. 475 (1814).

P. brachiata DOUGL. Hook. Fl. Bor.-Am. I, 137 (1833).

Lotodes esculenta OK. Rev. Gen. I, (1891).

Wats. and Coult., Gray's Man. 6 ed. 131; Webb., Fl. Neb. 132; Upham, Fl. Minn. 42; Coult., Fl. Colo. 57; Mac., Fl. Can. I, 108; Coult., Fl. Tex. 75; Wats., Bibl. Ind. I, 253.

North America: Saskatchewan valley to Brazos and Rio Grande valleys; plains E. of Rocky mts.

Minn. valley; W. and S. W. districts; E. to Chippewa valley and New Ulm; high prairies and hillsides.

HERB.: *Sheldon* 1365, Lake Benton; *Wickersheim* 1, Idlewild, Lincoln Co.; *Holzinger* 52, Cottonwood Co.; *Leiberg* 15, Blue Earth Co.; *Herb. Wickersheim* 29, Idlewild, Lincoln Co.; *Herb. Moyer* 53, Montevideo.

Psoralea incana NUTT. Fras. Cat. (1813).

P. argophylla PURSH, Fl. Am. 475 (1814).

Lotodes argophylla OK. Rev. Gen. I, (1891).

Wats. and Coult., Gray's Man. 6 ed. 131; Upham, Fl. Minn. 42; Webb., Fl. Neb. 132; Coult., Fl. Colo. 57; Mac., Fl. Can. I, 108; Wats., Bibl. Ind. I, 252.

North America: Red and Saskatchewan valleys to Rocky mts. of Brit. Col.; S. to Wisc., Minn., Neb., Kan. and Colo.; W. to Mont. and Wyoming.

Minn. valley: Throughout, at higher levels; dry prairies and hillsides; openings in forests.

HERB.: *Ballard* 195, Jordan, Scott Co.; *Ballard* 564, Prior's lake, Scott Co.; *Ballard* 360, Helena, Scott Co.; *Sheldon* 1114, Springfield; *Sheldon* 525, Waseca; *Sheldon* 712, Sleepy Eye; *Taylor* 379, Janesville; *Taylor* 584, Minnesota lake; *Taylor* 878, Glenwood; *Taylor* 778, Glenwood; *Sandberg* 126, Cannon Falls; *Kassube* 55, Minneapolis; *Leonard* 9, Spring Valley; *Herrick* 71, Minneapolis; *Herb. Sheld.* 1741, Minneapolis; *Herb. Moyer* 52, Minnesota valley near Montevideo.

LOTUS LINN. Gen. 600 (1737).

Tetragonolobus SCOP. Fl. Carn. II, 87 (1772).

Lotea WEBB. Phyt. Car. II, 80 (1842).

Anisolotus BERNH. Ind. Sem. Erfurth (1837).

Pedrosia LOWE, Hook. Journ. VIII, 292 (1847).

Heineckenia WEBB. Exs. Car. B. and H. l. c. (1843?)

Hosackia DOUGL. Benth. Bot. Reg. 1257 (—).

Syrmatium VOG. Linn. X, 590 (1836).

Baillon, *Hist. Pl.* II, 289, 291; Benth. and Hook., *Gen. Pl.* I, 490, 491; Durand, *Ind. Gen. Phan.* 92.

Living species: 200 described; 100 reduced; Europe; Asia; Africa; N. and S. America; Australia. N. America, 26–32; middle Calif., 31; W. Tex., 2; Canada, 5; Rocky mts., 2; E. Sts., 1; S. Sts., 1; Pl. King, 5; Pl. Wheel., 7.

Lotus americanus (NUTT.) BISCH. Hort. Heid. (1839).*L. sericeus* PURSH, Fl. Am. 489 (1814) *not DC.**Trigonella americana* NUTT. Gen. II, 120 (1818).*Hosackia unifoliolata* HOOK. Fl. Bor.-Am. I, 135 (1833).*Aemispon sericeum* RAF. N. Fl. I, 53 (1836).*Hosackia pilosa* NUTT. T. and G. Fl. I, 327, 692 (1838).*H. purshiana* BENTH. Bot. Reg. 1256 (—).

Wats. and Coult., Gray's Man. 6 ed. 131; Webb., Fl. Neb. 132; Upham, Fl. Minn. 42; Coult. Fl. Colo. 56; Brew. and Wats., Fl. Calif. I, 137; Chap., Fl. S. St. 91; Mac., Fl. Can. I, 108; II, 316; Coult., Fl. Tex. 75; Greene, Fl. Fran. 16; Roth., Wheel Exp. 43, 92, 359; Wats., King Exp. 63, 434; Cov., Fl. Ark. 174; Wats., Bibl. Ind. I, 226.

North America: Brit. Col. and Vancouver to Man.; S. to Washington, Calif., N. Mex. and Mexico; E. to Mont., Dak., Minn., Neb., Ark. and N. Car. (local).

Minn. valley: Far W., and E. to Redwood Co. and the Chippewa river; dry prairies, gravelly shores and banks.

HERB.: *Sheldon 1439*, Dakota line near Elkton; *Herb. Menzel 12*, Pipestone City.

LUPINUS LINN. Gen. 586 (1737).

Baillon, *Hist. Pl.* II, 334; Benth. and Hook., *Gen. Pl.* I, 480; Durand, *Ind. Gen. Phan.* 90.

Living species: 100± described; to be considerably reduced. North America, especially westward, to Bolivia and Brazil; a few around the Mediterranean and in tropical Africa. Russia, 3; Europe, 13; North America, 54–60; California, 50±; Canada 16–18 (Brit. Col. especially); Rocky mts., 13–15; Pl. King, 22; Pl. Wheel., 21; W. Tex., 2; E. Sts., 2; S. Sts. 3.

Lupinus perennis LINN. Spec. 721 (1753).*L. perennis* var. *occidentalis* WATS. Rev. Lup. 526 (1875).

Wats. and Coult., Gray's Man. 6 ed. 128; Britt., Fl. N. J. 80; Upham, Fl. Minn. 41; Chap., Fl. S. Sts. 89; Mac., Fl. Can. I, 102, 505; Wats., Bibl. Ind. I, 240.

North America: Toronto to L. Huron reg.; S. to N. Eng., N. J. and Fla.; W. to Minn., Mo. and Miss.

Minn. valley: N. E. district and perhaps along N. edge; Ft. Snelling to Litchfield; dry or sandy places.

HERB.: *Sandberg 124*, Marine Mills; *Holzinger 50*, Winona Co.; *Kassube 54*, Minneapolis; *Lewis 2*, Minneapolis; *Sandstein 1*, Lake Johanna.

LIII. GERANIACEAE. Geranium Family.

Endlicher, *Gen. Pl.* 1166 (1840); Lindl., *Veg. King.* 365 (1846)—*Vivianiaceae*; Benth. and Hook., *Gen. Pl.* I, 269 (1862)—excl. genus *Tropaeolum*,

Trib. III, *Limnantheae*, Trib. IV, *Oxalideae*, Trib. VII, *Balsamineae*; Baillon, *Hist. Pl.* V, 1 (1874)—Series I, II, III, IV; Reiche, in *Prantl and Engler*, *Nat. Pflanz.* 3, IV, 1 (1889).

Genera: 11; widely distributed over the earth.

Species: 360±; 45 per cent. in genus *Geranium* Linn., 2 fossil species from Baltic amber (*Conwentz*).

GERANIUM LINN. Gen. 554 (1737).

Baillon, *Hist. Pl.* V, 35; Benth. and Hook., *Gen. Pl.* I, 272; Durand, *Ind. Gen. Phan.* 50; Engler and Prantl, *Nat. Pflanz.* 3, VI, 8 (Reiche); Gray *Ill. Gen.* II, 127; Schenck, *Palaeophyt.* 530.

Living species: 160±; temperate regions, especially in N. hemisphere, and a few in the tropics; 4 Pac., 3 Atl.

Fossil species: 1-2, in amber (*Conwentz*).

Geranium carolinianum LINN. Spec. 682 (1753).

G. atrum MOENCH, *Meth.* 285 (1794).

G. lanuginosum JACQ. *Hort. Schoenb.* II, 8 (1797).

Wats. and Coult., *Gray's Man.* 6 ed. 104; Britt., *Fl. N. J.* 72; Upham, *Fl. Minn.* 36; Chap., *Fl. S. St.* 65; Wats., *Bibl. Ind.* I, 150; Mac., *Fl. Can.* I, 90; Brew. and Wats., *Fl. Calif.* I, 94; Engl., Reiche *Nat. Pflanz.* III, 4, 9; Coult. *Fl. Tex.* 50; Wats., *King Exp.* 50; Cov., *Fl. Ark.* 171.

North America: N. S. to Pac. and Arctic circle; S. to Maine, N. J. and Fla.; W. to S. Calif. and Tex.

Minn. valley: Forest district, particularly N. E.; barren woods and openings.

HERB.: *Taylor* 1067, Alexandria; *Ballard* 525, Cleary's lake, Scott Co.; *Ballard* 594, Prior's lake, Scott Co.; *Roberts* 20, Duluth; *Bailey* 199, Vermilion lake; *Herrick* 56, St. Louis river; *Herrick* 57, Minneapolis; *Sandberg* 105, Red Wing; *Sandberg* 106, Taylor's Falls.

Geranium maculatum LINN. Spec. 681 (1753).

Wats. and Coult., *Gray's Man.* 6 ed. 103; Britt., *Fl. N. J.* 72; Chap., *Fl. S. St.* 65; Upham, *Fl. Minn.* 36; Mac., *Fl. Can.* I, 90; Led., *Fl. Ross.* I, 463?; Cov., *Fl. Ark.* 171; Wats., *Bibl. Ind.* 151.

Ural and Baikal Siberia?

North America: Newf., N. S., Ont. to Rainy river; S. to N. Eng., N. J. and Va.; W. to Minn., Kan. and Ark.

Minn. valley: Forest district to Blue Earth Co.; edges of woods and along streams.

HERB.: *Taylor* 271, Janesville; *Sheldon* 132, Madison Lake; *Ballard* 40, Chaska; *Oestlund* 20, Ramsey Co.; *Holzinger* 41, Winona Co.; *Oestlund* 21, Hennepin Co.; *Sandberg* 104, Goodhue Co.; *Herb. Sheld.* 1884, Minneapolis; *Herb. Wickersheim* 27, Mankato.

LIV. OXALIDACEAE. Wood-Sorrel Family.

Endlicher, *Gen. Pl.* 1171 (1840); Benth. and Hook., *Gen. Pl.* I, 270 (1862)—sub *Geraniaceae*; Baillon, *Hist. Pl.* V, 22 (1874)—sub *Geraniaceae*; Reiche, *Engler and Prantl, Nat. Pflanz.* 3, IV, 15 (1889).

Genera: 7; tropical and subtropical regions, sparingly in temperate zones; center in S. Africa and S. America.

Species: 250±; 90 per cent. in genus *Oxalis* Linn.

OXALIS LINN. Gen. 377 (1737).

Biophytum DC. Prodr. I, 689 (1824).

Oxys TOURN. Inst. 88 (1700).

Baillon, *Hist. Pl.* V, 41; Benth. and Hook., *Gen. Pl.* I, 276; Durand, *Ind. Gen. Phan.* 51; Engler and Prantl, *Nat. Pflanz.* 3, VI, 19, 21 (Reiche); Gray, *Ill. Gen.* II, 111; Schenck, *Palaeophyt.* 530.

Living species: 250±; Africa, tropical Asia and America; 3-4 temperate regions; 1-2, tropics of both hemispheres, the rest in S. Africa and tropical America to S. America. North America, 10-12; W. Tex., 6; S. Sts., 3; Rocky mts., 2-3; E. Sts., 5; Canada, 3-4; California, 2; Pl. Wheel., 1.

Fossil species: 2 in amber (*Conwentz*).

Oxalis stricta LINN. Spec. 435 (1753).

O. dillenii JACQ. Oxal. 15, 28 (1794).

O. florida SALISB. Prodr. 322 (1796).

O. corniculata LINN. var. *stricta* SAV. Lam. Enc. Meth. IV, 683 (1797).

O. lyoni PURSH, Fl. Am. 322 (1814).

Wats. and Coult., Gray's Man. 6 ed. 105; Britt., Fl. N. J. 73; Webb., Fl. Neb. 121; Coult., Fl. Colo. 45; Chap., Fl. S. St. 63; Brew. and Wats., Fl. Calif. I, 96; Hook., Fl. Gt. Brit. 84; Mac., Fl. Can. I, 92, 503; Forbes and Hems., Fl. Sin. 99; Led., Fl. Ross. I, 483; Wats., Bibl. Ind. I, 153; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 34; Engl. Reiche, Nat. Pflanz. III, 4, 21; Coult., Fl. Tex. 52; Greene, Fl. Fran. 100; Cov., Fl. Ark. 171.

Middle and N. Europe; N. Asia; China.

North America, N. S. to Man.; S. to N. Eng., Fla.; W. to Colo., Tex. and California.

Minn. valley: Throughout at all levels; damp or cultivated ground; banks of streams and in ravines.

HERB.: *Sheldon* 1111, Springfield; *Taylor* 586, Minnesota lake; *Sheldon* 20, Elysian; *Sheldon* 166, Madison Lake; *Sheldon* 965, Sleepy Eye; *Taylor* 122, Janesville; *Taylor* 747, Glenwood; *Ballard* 22, Chaska; *Ballard* 658, Waconia; *Ballard* 534, Cleary's lake, Scott Co.; *Herrick* 64, St. Louis river; *Roberts* 22, Beaver bay; *Sandberg* 110, Cannon Falls; *Herrick* 65, Minneapolis; *Herb. Sheld.* 1741, Minneapolis.

Oxalis longiflora LINN. Spec. 433 (1753).*O. violacea* LINN. Spec. 434 (1753).*O. vespertilionis* GRAY, Pl. Fendl. 27 (1849).

Wats. and Coult., Gray's Man. 6 ed. 105; Britt., Fl. N. J. 73; Webb., Fl. Neb. 121; Coult., Fl. Colo. 45; Upham, Fl. Minn. 36; Chap., Fl. S. St. 63; Roth., Wheel. Exp. 81; Cov., Fl. Ark. 171; Wats., Bibl. Ind. I, 153.

North America: N. Eng. to Colo. and S. to N. J., Fla. and Ark.

Minn. valley: E. and central districts to Chippewa river; dry or rocky places and in sterile soil.

HERB.: *Ballard* 268, Jordan, Scott Co.; *Sheldon* 745, Sleepy Eye; *Taylor* 587, Minnesota lake; *Sheldon* 1598, Lake Benton; *Taylor* 351, Janesville; *Huntington* 3, Rock Co.; *Her- rick* 63, Minneapolis; *Sandberg* 109, Cannon Falls; *Herb. Sheld.* 1885, Minneapolis; *Herb. Moyer* 46, Montevideo.

LV. LINACEAE. Flax Family.

Endlicher, *Gen. Pl.* 1170 (1840); Benth. and Hook. *Gen. Pl.* I, 241 (1862)—*excl. Trib. III, Erythroxyleae*; Baillon, *Hist. Pl.* V, 42 (1874)—*excl. series III, Erythroxyleae*; Reiche, Engler and Prantl, *Nat. Pflanz.* 3, IV, 27 (1889).

Genera: 9–10; tropical, subtropical and temperate regions.

Species: 120±, 75 per cent. in genus *Linum* Linn.

LINUM LINN. Gen. 254 (1737).

Adenolinum, Cathartolinum, Linopsis, Xantholinum REICH. Ic. Fl. Germ. VI, 67 (1844).

Cliococca BAB. Trans. Linn. Soc. XIX, 33 (1855).

Radiola GMEL. Syst. 289 (1805).

Reinwardtia DUM. Com. Bot. 19 (1822).

Macrolinum REICH. Ic. Fl. Germ. VI, 68 (1844).

Baillon, *Hist. Pl.* V, 63; Benth. and Hook., *Gen. Pl.* I, 242, 243, 987; Durand, *Ind. Gen. Phan.* 46; Engler and Prantl, *Nat. Pflanz.* 3, IV, 30, 31 (Reiche); Gray, *Ill. Gen.* II, 107; Schenck, *Palaeophyt.* 530.

Living species: 95±; cosmopolitan, mts. in tropics. Russia, 20; Europe, 33; Russian Europe, 14; North America, 18–21; Mid. Calif., 10; Canada, 6; E. Sts., 5; Rocky mts., 3; S. Sts., 4; Pl. Wheel., 3; Pl. King, 2; W. Tex., 9; Pac. coast, 14.

Fossil species: 1; very doubtful, in Oligocene of Europe (*Conwentz*).

Linum rigidum PURSH, Fl. Am. 210 (1814).

Wats. and Coult., Gray's Man. 6 ed. 102; Coult., Fl. Colo. 42; Upham, Fl. Minn. 35; Mac., Fl. Can. I, 89; Coult., Fl. Tex. 47; Roth., Wheel. Exp. 77, 78 in var.; Cov., Fl. Ark. 171; Wats., Bibl. Ind. I, 147; Webb., Appx. Neb. 32.

North America: Saskatchewan to N. W. T.; S. to Minn., Neb., Ark., S. Colo. and Tex.

Minn. valley: W. and S. at higher levels; dry prairies and meadows.

HERB.: *Sheldon* 1371, Lake Benton; *Taylor* 1016, Glenwood; *Herb. Moyer* 43, Montevideo.

Linum sulcatum RIDDELL, Cat. Pl. Ohio Suppl. 10 (1836).

L. striatum NUTT. Gen. I, 206 (1818) *not* Walt.

L. rigidum T. and G. Fl. I, 204 (1838) *in part*.

Wats. and Coult., Gray's Man. 6 ed. 102; Webb., Fl. Neb. 121; Upham, Fl. Minn. 35; Britt., Fl. N. J. 71; Mac., Fl. Can. I, 89; Coult., Fl. Tex. 47; Cov., Fl. Ark. 171; Wats., Bibl. Ind. I, 147.

North America: Ont. to N. W. T.; S. to Mass., N. J.; W. to Minn., Dak., Neb., Ark. and Tex.

Minn. valley: Throughout; prairies; dry meadows and forest openings; common.

HERB.: *Sheldon* 1117, Springfield; *Sheldon* 1447, Pipestone City; *Sheldon* 824, Cottonwood river near Sleepy Eye; *Taylor* 791, Glenwood; *Herrick* 54, Minneapolis; *Herrick* 55, Minneapolis; *Sandberg* 102, Goodhue Co.; *Oestlund* 19, Minneapolis; *Gedge* 3, Detroit lake; *Sandberg* 103, Cannon Falls; *Herb. Sheld.* 1704, Minneapolis; *Herb. Moyer* 42, Montevideo.

Linum lewisii PURSH, Fl. Am. 210 (1814).

L. perenne var. *lewisii* EAT. and WR. Man. 302 (1841).

Wats. and Coult., Gray's Man. 6 ed. 102; Webb. Fl. Neb. 121; Upham, Fl. Minn. 35; Coult., Fl. Colo. 42; Brew. and Wats., Fl. Calif. I, 89; Mac., Fl. Can. I, 89; Coult., Fl. Tex. 46; Cov., Fl. Ark. 171; Wats., Bibl. Ind. I, 146.

North America: Man. to Pac. and Arctic ocean; S. to Calif.; in mts. to Colo., Arizona and Mexico; E. to Ark., Neb., Iowa and Minn.

Minn. valley: N. W. district and Leaf hills; rare; dry, high prairies and hillsides.

LVI. RUTACEAE. Rue Family.

Endlicher, *Gen. Pl.* 1159 (1840); *Aurantiaceae*, *Zanthoxyleae*, *Diosmeae*, Endl. *Gen. Pl.* 1143-1149 (1840); Benth. and Hook., *Gen. Pl.* I, 278 (1862); Baillon, *Hist. Pl.* IV, 373 (1873)—excl. series X, *Cneoraceae*.

Genera: 125±; center in S. Africa and Australia; principally tropical and temperate; almost absent from tropical Africa.

Species: 800±, many arborescent.

ZANTHOXYLUM LINN. Gen. ed. VI, 1109 (1764).**Fagara** LINN. Gen. 1109 (1737).**Ochroxylum** SCHREB. Gen. 826 (1774).**Curtisia** SCHREB. Gen. 199 (1774).**Pohlana** NEES and MART. N. Act. Cur. XI, 185 (1823).**Kampmannia** RAF. Med. Rep. II, hex. V, 350 (1808).**Lacaris** HAM. ex Wall. Cat. 7119 (1840?).**Langsdorfia** LEANDR. Act. Monac. 229 (1819).**Macqueria** COMMERS, ex Juss. Gen. 374 (1789).**Pentanoma** MOC. and SESS. Fl. Mex. ex D. C. Prodr. II, (1825).**Perijaea** TUL. Ann. Sci. Nat. Ser. 3, VII, 279 (1847).**Pterota** P. BR. Jam. Hist. 146, 5 (1756).**Rhetsa** W. and ARN'T. Prodr. I, 147 (1834).**Tobinia** DESVX. Ham. Prodr. Ind. Occ. 56 (1825).**Typalia** DENST. Hort. Malab. V, 34 (1818).**Blackburnia** FORST. Char. Gen. 6 (1776).

Baillon, *Hist. Pl.* IV, 468; Benth. and Hook., *Gen. Pl.* I, 297; Durand, *Ind. Gen. Phan.* 55; Gray, *Ill. Gen.* I, 147; Schenck, *Palaeophyt.* 531; Sarg., N. A. Silva I, 65.

Living species; $110 \pm$; 80 (B. and H.); all tropical and warmer regions; very numerous in China; wanting in Europe. North America, 5; S. Sts., 3; W. Tex., 2; E. Sts., 2; Canada, 1.

Fossil species: 12–15; Tertiary, N. Europe (*Heer*); N. America (*Lesquereaux*)—3 sp. in Californian region; Japan (*Nathorst*).

Zanthoxylum americanum MILL. Dict. 57 (1768).*Xanthoxylum fraxinifolium* MARSH. Arbust. 167 (1785).*Z. fraxineum* WILLD. Berl. Baum. 413 (1796).*Z. ramifolium* MICHX. Fl. II, 235 (1803).*X. mite* WILLD. Enum. 1013 (1809).*Thylax fraxineum* RAF. Med. Bot. II, 114 (1830).*Z. tricarpum* HOOK. Fl. Bor.-Am. I, 118 (1833).

Wats. and Coult., Gray's Man. 6 ed. 106; Britt., Fl. N. J. 74; Webb., Fl. Neb. 121; Upham, Fl. Minn. 37; Mac., Fl. Can. I, 93; Sarg., Silva I, 67, footnote; Wats., Bibl. Ind. I, 155.

North America: Q. to W. Ont.; S. to N. Eng., N. J. and Del.; W. to Minn. and Neb.

Minn. valley: Forest district and W. to Chippewa and Pomme de Terres rivers; woods and river banks; common.

HERB.: *Taylor* 26, Elysian; *Sheldon* 42, Elysian; *Sheldon* 793, Sleepy Eye; *Sheldon* 378, Madison Lake; *Taylor* 693, Minnesota lake; *Ballard* 105, Shakopee; *Taylor* 1042, Glenwood; *Oestlund* 23, Hennepin Co.; *Kassube* 46, Minneapolis; *Sandberg* 111, Red Wing; *Herb. Sheld.* 1851, Minneapolis; *Herb. Moyer* 47, Montevideo.

PTELEA LINN. Gen. 78 (1737).**Bellucia** ADANS. Fam. Pl. II, 344 (1763).

Baillon, *Hist. Pl.* IV, 482; Benth. and Hook., *Gen. Pl.* I, 301; Durand, *Ind. Gen. Phan.* 55; Gray *Ill. Gen.* II, 149; Schenck, *Palaeophyt.* 534; Sarg. N. A. Silva I, 75.

Living species: 7; temperate N. America and S. Mexico. W. Tex., 2; Mid. Calif., 1; S. Sts., 4; E. Sts., 1; Canada, 1; Rocky mts., 1; Pl. Wheel., 1; Pl. King, 1.

Fossil species: 7-10; Tertiary; Oligocene, Europe (*Heer*); Greenland (*Heer*); Sagor (*Ettinghausen*); Hungary (*Unger*).

Ptelea trifoliata LINN. Spec. 118 (1753).*P. pentaphylla* FABR. Enum. Pl. Helmst. 416 (1759).*P. viticifolia* SALISB. Prodr. 68 (1796).*P. tomentosa* RAF. Fl. Lud. 108 (1817).

Wats. and Coult., Gray's Man. 6 ed. 107; Britt., Fl. N. J. 74; Wats., Bibl. Ind. I, 154; Upham, Fl. Minn. 37; Chap., Fl. S. St. 66; Mac., Fl. Can. I, 93, 505; Coult., Fl. Tex. 54; Sarg., Silva, I, 76; Cov., Fl. Ark. 171.

North America: S. Ont. and Long Island to Fla.; W. to Minn., Ark. and Cent. and W. Tex.

Minn. valley: S. E. districts?; doubtful, but reported from S. E. portion of State. No Minn. specimens have been seen.

LVII. POLYGALACEAE. Polygala Family.

Endlicher, *Gen. Pl.* 1077 (1840); Benth. and Hook., *Gen. Pl.* I, 134 (1862); Baillon, *Hist. Pl.* V, 71 (1874).

Genera: 11; temperate and warmer regions.

Species: 400; principally small herbs.

POLYGALA LINN. Gen. 567 (1737).**Solomonias** LOUR. Coch. Fl. 14 (1790).**Psycanthus** and **Triclisperma** RAF. Specch. 116, 117 (1814).**Epirhizanthus** BLUME, Cat. Buit. 25 (1823).

Badiera, **Brachytropis**, **Chamaebuxus**, **Senega** DC. Prodr. I, 321 seq. (1824).

Isolophus, **Tricolophus** SPACH, Suit. Buff. XI, 112 (1842).**Semeiocardium** HASSK. Hort. Bogor. 227 (1844).**Phylace** NOR. ex Hassk. l. c. (1844).**Acanthocladus** KLOTZSCH, Pl. Sell. (1846?).**Penaea** PLUM. Gen. 22 (1703).

Baillon, *Hist. Pl.* V, 87; Benth. and Hook., *Gen. Pl.* I, 136, 137, 974; Durand, *Ind. Gen. Phan.* 27; Gray, *Ill. Gen.* II, 221.

Living species: 275±; cosmopolitan. Europe, 21; Russia, 8; Russian Europe, 8; N. America, 36; S. Sts., 26-28; Calif., 3; Canada, 6; E. Sts., 15-17; Pl. Wheel., 2; W. Tex., 8.

Polygala verticillata LINN. Spec. 706 (1753).

Wats. and Coult., Gray's Man. 6 ed. 122; Chap., Fl. S. St. 85; Britt., Fl. N. J. 59; Webb., Fl. Neb. 122; Upham, Fl. Minn. 40; Coult., Fl. Colo. 30; Mac., Fl. Can. I, 66, 494; Coult., Fl. Tex. 26; Cov., Fl. Ark. 168; Wats., Bibl. Ind. I, 93; Wheel., Rev. Polyg. 122.

North America: Ont. and St. Lawrence valley to Saskatchewan; S. to N. Eng., N. J., Fla. and Miss.; W. to Dak., Neb., Colo., Utah, Ark. and Tex.

Minn. valley: Throughout at higher levels, particularly W.; hillsides and dry prairie.

HERB.: *Sheldon* 964, Sleepy Eye; *Sheldon* 816, Sigel township, Brown Co.; *Sheldon* 1346, Verdi, Lincoln Co.; *Sheldon* 1110, Springfield.

Polygala paucifolia WILLD. Spec. III, 880 (1800).

P. uniflora MICHX. Fl. N. Am. II, 53 (1803).

P. purpurea AIT. f. Hort. Kew. IV, 244 (1812).

Triclisperma grandiflora RAF. Specch. I, 117 (1814).

Wats. and Coult., Gray's Man. 6 ed. 120; Britt., Fl. N. J. 59; Upham, Fl. Minn. 41; Chap., Fl. S. St. 85; Mac., Fl. Can. I, 66, 494; Wats., Bibl. Ind. I, 92; Wheel., Rev. Polyg. 141.

North America: N. Br., Ont., L. Superior reg. and Saskatchewan; S. to N. Eng., N. J., Penn. and Ga.; W. to Minn. and Ill.

Minn. valley: Reported from S. E. edge; rare; woods and shaded banks.

Polygala senega LINN. Spec. 704 (1753).

Senega officinalis SPACH, Hist. Veg. VII, 129 (1839).

Wats. and Coult., Gray's Man. 6 ed. 120; Britt., Fl. N. J. 59; Chap., Fl. S. St. 85; Upham, Fl. Minn. 40; Mac., Fl. Can. I, 66, 494; Cov., Fl. Ark. 168; Wats., Bibl. Ind. I, 93; Wheel., Rev. Polyg. 134.

North America: N. Br., Ont., Man. to Rocky mts.; S. to N. Eng., N. J., Carolinas and Tenn.; W. to Minn., Dak. and Ark.

Minn. valley: Forest district to Chippewa river, infrequent W.; rocky and dry banks.

HERB.: *Ballard* 92, Shakopee; *Sheldon* 424, Janesville; *Sheldon* 533, Waseca; *Taylor* 148, Janesville; *Hammond* 21, Lake City; *Herb. Sheld.* 1877, Minneapolis.

Polygala senega LINN. var. *latifolia* T. and G. Fl. N. A. I, 131 (1838).

Wats. and Coult., Gray's Man. 6 ed. 121; Wheel., Rev. Polyg. 135.

North America: Md. to Mich.; Penn. to Va., Ky. and Tenn.; W. to Minn.

Minn. valley: Forest and N. E. districts; shaded

banks and woodland.

HERB.: *Ballard* 200, Jordan, Scott Co.

***Polygala cruciata* LINN.** Spec. 706 (1753).

P. cuspidata HOOK. Journ. Bot. I, 194 (1834).

Wats. and Coult., Gray's Man. 6 ed. 121; Britt., Fl. N. J. 59; Webb., Fl. Neb. 122; Upham, Fl. Minn. 40; Chap., Fl. S. St. 84; Wats., Bibl. Ind. I, 90; Wheel., Rev. Polyg. 117.

North America: Maine, N. J., N. Car. to Fla.; W. to Minn., Neb., Kan. and La.

Minn. valley: N. edge and in vicinity of Ft. Snelling; Dakota Co.; low ground and base of hills.

***Polygala viridescens* LINN.** Spec. 705 (1753).

P. sanguinea LINN. Spec. 705 (1753).

P. purpurea NUTT. Gen. II, 88 (1818).

Wats. and Coult., Gray's Man. 6 ed. 121; Upham, Fl. Minn. 40; Chap., Fl. S. St. 83; Britt., Fl. N. J. 59; Mac., Fl. Can. I, 66, 494; Cov., Fl. Ark. 168; Wats., Bibl. Ind. I, 92; Wheel., Rev. Polyg. 127.

North America: Ont. and Maine to N. J. and N. Car.; W. to Minn., Kan., Ark. and Ind. Terr.

Minn. valley: Forest district; Ft. Snelling to Chipewewa river; low or sandy soil; river banks.

HERB.: *Oestlund* 28, Hennepin Co.; *Herrick* 70, Minneapolis; *Kassube* 53, Minneapolis; *Sandberg* 123, Red Wing; *Bodin* 1, Center City; *MacM.* and *Sheld.* 50, Brainerd.

LVIII. EUPHORBIACEAE. Spurge Family.

Endlicher, *Gen. Pl.* 1107 (1840); *Antidesmeae*, Endlicher, *Gen. Pl.* 287 (1840); *Bennettiaceae*, Schizl. *Icon. t.* 172 (1843); *Daphniphyllaceae*, Müll-Arg., *DC. Prodr.* xvi, I, 1 (1869); *Hippomaneae*, Agardh, *Theor. Syst.* 244 (1858); *Stilaginaceae* and *Scepaceae*, Lindl. *Veg. King.* 259, 283 (1846); *Phyllanthaceae* Agardh, *Syst. Theor.*; *Pseudanthaceae*, *Putranjiveae*, Endlicher, *Gen. Pl.* 288 (1840); *Tithymali* Adans. *Fam.* 356 (1763); *Trewiaceae*, Lindl. *Nat. Syst.* ed. II, 174 (1836); *Tricoccae* Linn. *Philos. Bot.* 32 (1751); Benth. and Hook., *Gen. Pl.* III, 239 (1883); Baillon, *Hist. Pl.* V, 105 (1874); Pax in *Engler and Prantl, Nat. Pflanz.* III, 5, 1 (1890).

Genera: 200-220; cosmopolitan; a large number xerophytic; principally in the tropics, but very many temperate forms. Baillon recognises 150± genera.

Species: 3500±, including a large number of desert plants especially in S. Africa, and the Malayan peninsula.

RICINOCARPUS BURM. *Thes. Zeyl.* 203 (1737), p. p em. O. K. l. c. (1891).

***Acalypha* LINN.** *Corr. Gen.* 986 (1737, later).

***Cupameni* ADANS.** *Fam.* II, 356 (1763).

Linostachys KLOTZSCH, Linn. XIX, 235 (1845).

Gymnalypha GRISEB. Bonpland. VI, 2 (1858).

Caturus LINN. ex Schreb. Gen. Pl. 677 (1792).

Galurus SPRENG. Syst. I, 138 (1825).

Odonteilema TURCZ. Bull. Soc. Imp. Nat. Mosc. I, 587 (1848).

Calypotropatha KLOTZSCH, Pet. Moss. Bot. 96 (1862-64).

Benth. and Hook., *Gen. Pl.* III, 311; Durand, *Ind. Gen. Phan.* 368; Engler and Prantl, *Nat. Pflanz.* 3, V, 60 (*Pax*); O. Kuntze, *Rev. Gen.* II, (1891).

Living species: $220 \pm$; tropical regions; a few extending into the temperate zones. S. Sts., 5-6; Canada, 1; N. America, $10 \pm$.

Ricinocarpus virginicus (LINN.) OK. Rev. Gen. II, 615 (1891).

Acalypha virginica LINN. Spec. (1753).

A. caroliniana WALT. Fl. Car. 238 (1788).

A. virginica var. *genuina* MULL.-ARG. Linn. XXXIV, 44 (1860).

Wats. and Coult., Gray's Man. 6 ed. 459; Britt., Fl. N. J. 215; Webb., Fl. Neb. 123; Upham, Fl. Minn. 123; Mac., Fl. Can. I, 427; Chap., Fl. S. St. 405; Cov., Fl. Ark. 218; Engl. Pax, Nat. Pflanz. III, 5, 62.

North America: Ont. and N. Eng. to Fla.; W. to Minn., Neb. and Ark.

Minn. valley: Forest district to Blue Earth Co.; E. and S.; fields, openings and roadsides.

HERB.: Sandberg 492, Red Wing; Manning 8, Lake City; Holzinger 208, Winona Co.

EUPHORBIA LINN. Gen. 429 (1737).

Tithymalus GAERT. Fruct. II, 115 (1791).

Anisophyllum HAW. Syn. Succ. 159 (1812).

Adenopetalum, Eumecanthus, Leptopus, Dichrophyllum, Tithymalopsis, Tricherostigma, Euphorbiastrum, Arthrothamnus, Sterigmanthe KLOTZSCH and GARCKE, Monatsb. Akad. Berl. (1859).

Petaloma RAF. Fl. Tell. (1836).

Alectorocotonum SCHLECHT. Linn. XIX, 252 (1845).

Poinsettia GRAH. Edin. Phil. Journ. XX, 412 (1840).

Anthacantha LEM. Ill. Hort. (1858).

Treissia, Dactylanthus, Medusea, Galarhoeus, Esula HAW. Succ. 131-153 (1812).

? **Keraselma** and **Athymalus** NECK. Elem. II, 353 (1790).

Benth. and Hook., *Gen. Pl.* III, 258; Durand, *Ind. Gen. Phan.* 360; Engler and Prantl, *Nat. Pflanz.* 3, V, 103 (*Pax*); Schenck, *Palaeophyt.* 594.

Living species: $600 \pm$; tropical and temperate regions; less abundant in the tropics. Europe, 107; Russia, 70; European Russia, 38; E. Sts., 19-20; Rocky mts., 15; Mid. Calif., 9; all Calif., 15; Canada, 9; S. Sts., 32; Pl. King, 6; Pl. Wheel., 11; N. America, 55-60.

Fossil species: Tertiary; Bonn, Bohemia; *Euphorbioides* (Wessel and Weber); *Euphorbiophyllum* (Ettinghausen).

Euphorbia dictyosperma FISCH. and MEY. Ind. Sem. Petrop. 37 (1835).

E. arkansana ENGELM. and GRAY, Pl. Lindh. I. 53 (1845).

Wats. and Coult., Gray's Man. 6 ed. 455; Webb., Fl. Neb. 123; Upham, Fl. Minn. 123; Coult., Fl. Colo. 327; Wats., Fl. Calif. II, 75; Greene, Fl. Fran. 90; Roth., Wheel, Exp. 248; Wats., King Exp. 320; Engl. Pax, Nat. Pflanz. III, 5, 110.

North America: Oregon to Santa Barbara; E. to Tex., Ky., Iowa and Minn.

Minn. valley: W. districts; prairies; infrequent or rare.

HERB.: *Moyer* 217, Montevideo.

Euphorbia heterophylla LINN. Amoen. Acad. III, 112 (1756).

E. cyathophora MURR. Prodr. Gött. (1770).

Wats. and Coult., Gray's Man. 6 ed. 454; Webb., Fl. Neb. 123; Upham, Fl. Minn. 123; Cov., Fl. Ark. 217; Engl. Pax, Nat. Pflanz. III, 5, 107.

North America: Minn., Ill., Iowa, Neb., Kan., Mo., Ark. and Tenn.?

Minn. valley: Throughout; local or infrequent; sandy slopes and sunny banks of streams or lakes.

HERB.: *Sheldon* 797, Sigel township, Brown Co.; *Sheldon* 941, Redwood Falls; *Oestlund* 179, Minneapolis; *Herrick* 268, Minneapolis; *Herrick* 269, Minneapolis.

Euphorbia corollata LINN. Amoen. Acad. III, 122 (1756).

Galarhoeus corollatus HAW. Succ. II, 161 (1812).

Wats. and Coult., Gray's Man. 6 ed. 454; Britt., Fl. N. J. 214; Mac., Fl. Can. I, 425; Upham, Fl. Minn. 123; Webb., Fl. Neb. 123; Cov., Fl. Ark. 217.

North America: L. Huron to Ont. and Mass.; S. to N. Y., N. J., Fla.; W. to Minn., Dak., Neb., Ark. and La.

Minn. valley: Throughout; frequent; dry or open and sandy fields.

HERB.: *Ballard* 644, Chaska; *Leonard* 44, Fillmore Co.; *Holzinger* 207, Winona Co.; *Herrick* 267 Minneapolis; *Oestlund* 169, Minneapolis; *Kassube* 213, Minneapolis; *Sandberg* 491, Goodhue Co.

Euphorbia marginata PURSH, Fl. Am. II, 607 (1814).

E. leucoloma RAF. in Herb. Phil. (1833).

Wats. and Coult., Gray's Man. 6 ed. 454; Webb., Fl. Neb. 123; Upham, Fl. Minn. 123; Coult., Fl. Colo. 327; Engl. Pax, Nat. Pflanz. III, 5, 106.

North America: Minn., Dak., Colo., Neb., Kan. and Mo.; spreading eastward to Ohio.

Minn. valley: S. W. districts to Franklin township eastward; hills and banks or high fields.

HERB.: *Sheldon* 930, Crow creek, near Redwood Falls

***Euphorbia nutans* LAGASCA, Gen. et. Spec. 17 (1816).**

E. maculata LINN. Mant. (1767).

? *E. androsaemifolium* PRESL, Delic. Prag. 57 (1822).

E. presslii GUSS. Prodr. Fl. Sicul. I, 539 (1827).

E. hypericifolia Plur. Auct. Amer.

? *E. trinervis* BERTOL. Fl. Ital. V, 37 (1842).

E. hypericifolia var. *communis* ENGELM. Chap., Fl. S. St. 403 (1860).

Wats. and Coult., Gray's Man. 6 ed. 453; Britt., Fl. N. J. 214; Webb., Fl. Neb. 123; Upham, Fl. Minn. 123; Mac., Fl. Can. I, 427; II, 354; Greene, Fl. Fran. 92; Roth., Wheel. Exp. 247; Engl. Pax, Nat. Pflanz. III, 5, 104.

North America: Ont. ? and N. Eng. to N. J. and Fla.; W. to Dak., Neb., Kan. and Ark.; also in upper Sacramento valley and in C. America and Ecuador.

Minn. valley: Forest district; not common; open, sterile places or in fields.

HERB.: *Sandberg* 490, Red Wing; *Holzinger* 206, Dresbach; *Herrick* 266, Minneapolis.

***Euphorbia humistrata* ENGELM. Gray's Man. 3 ed. 386 (1859).**

Wats. and Coult., Gray's Man. 6 ed. 453; Britt., Fl. N. J. 214; Webb., Fl. Neb. 123; Upham, Fl. Minn. 123; Greene, Fl. Fran. 92.

North America: Ind. and W. Tenn. to Minn., Dak., Neb. and Kan.; also in Calif. and introd. in N. J.

Minn. valley: E. edge and S. districts; rare; alluvial soil in shaded places.

HERB.: *Sandberg* 489, Red Wing.

***Euphorbia maculata* LINN. Spec. 21 (1753).**

E. thymifolia PURSH, Fl. Am. II, 606 (1814).

E. depressa TORR. Ell. Sk. II, 655 (1824).

E. hypericifolia HOOK. Fl. Bor.-Am. II, 140 (1840) *in part*.

Wats. and Coult., Gray's Man. 6 ed. 453; Britt., Fl. N. J. 214; Webb., Fl. Neb. 123; Upham, Fl. Minn. 123; Mac., Fl. Can. I, 425; Chap., Fl. S. St. 403; Coult., Fl. Colo. 326; Cov., Fl. Ark. 217; Engl. Pax, Nat. Pflanz. III, 5, 105.

North America: Ont. to Saskatchewan; N. Eng. to Fla.; W. to Dak., Colo., Neb., Mo. and Ark.

Minn. valley: Throughout; particularly S. W. districts; banks, fields and roadsides.

HERB.: *Ballard* 526, Cleary's lake, Scott Co.; *Sheldon* 917, Sleepy Eye; *Sheldon* 1560, Lake Benton; *Sheldon* 1285, Lake Benton; *Sheldon* 986, Cross lake, Brown Co.; *Oestlund* 167, Hennepin Co.; *Oestlund* 168, Minneapolis; *Herrick* 265, Minneapolis; *Holzinger* 205, Winona Co.; *Sandberg* 488, Red Wing.

Euphorbia glyptosperma ENGELM. Bot. Mex. Bound. II, 187 (1859).

E. polygonifolia HOOK. Fl. Bor.-Am. II, 140 (1848) *in part*.

Wats. and Coult., Gray's Man. 6 ed. 453; Webb., Fl. Neb. 123; Upham, Fl. Minn. 123; Mac., Fl. Can. I, 425; Coult., Fl. Colo. 328; Wats., Fl. Calif. II, 74; Wats., King Exp. 320; Roth., Wheel. Exp. 246.

North America; Ont., Saskatchewan, Brit. Col. to Pac.; S. to Minn., Dak., Neb., Mo., Ill., Wisc. and Colo.

Minn. valley: Throughout; common; sandy places and embankments.

HERB.: *Sheldon* 966, Sleepy Eye; *Sheldon* 1557, Lake Benton; *Sheldon* 1169, New Ulm; *Sheldon* 1597, Lake Benton; *Ballard* 161, Chaska; *Taylor* 784, Glenwood; *Sheldon* 1102, Springfield; *Ballard* 527, Cleary's lake, Scott Co.; *Holzinger* 204, Winona Co.; *Oestlund* 166, Minneapolis; *Herrick* 264, Minneapolis; *Holzinger* 205, Winona Co.; *Herb. Sheld.* 1925, Minneapolis.

Euphorbia serpyllifolia PERS. Syn. II, 14 (1807).

Wats. and Coult., Gray's Man. 6 ed. 453; Webb., Fl. Neb. 123; Mac., Fl. Can. I, 424; Upham, Fl. Minn. 123; Wats., Fl. Calif. II, 74; Coult., Fl. Colo. 326; Greene, Fl. Fran. 91; Wats., King Exp. 320; Roth., Wheel. Exp. 246; Engl. Pax, Nat. Pflanz. III, 5, 105.

North America: Columbia river, Moose mt., N. W. T., Saskatchewan; S. along Pac. to Monterey and Gt. Basin region to Tex. and Mex.; E. to Kan., Neb., Dak. and Minn.

Minn. valley: Throughout; frequent; sandy or waste places or embankments.

HERB.: *Taylor* 1152, Glenwood; *Herb. Sheld.* 1900, Cedar lake, Hennepin Co.

Euphorbia geyeri ENGELM. Pl. Lindh. I, 52 (1845).

Wats. and Coult., Gray's Man. 6 ed. 452; Upham, Fl. Minn. 123; Webb., Appx. Neb. 33.

North America: Ill., Wisc., Minn., Kan., Neb. to Tex.

Minn. valley: Reported from N. E. district; sandy places or along railway embankments.

LIX. STELLARIACEAE. Water-Starwort Family.

Benth. and Hook., *Gen. Pl.* I, 673 (1862)—sub *Haloragaceae*; Baillon, *Hist. Pl.* V, 250 (1874)—sub *Euphorbiaceae*; Pax in *Engler and Prantl, Nat. Pflanz.* 3, V, 120 (1890)—*Callitrichaceae*; Endlicher, *Gen. Pl.* 268 (1840)—*Callitrichinae*.

Genera: 1; cosmopolitan in fresh waters; aquatic.

Species: 1-2; 25 (*Hegelmaier*).

STELLARIA LUDW. Defin. 27 (1737).**Callitriche** LINN. Syst. VI, 82 (1748) ex O. Kuntze l. c. (1891).Benth. and Hook., *Gen. Pl.* I, 676; Durand, *Ind. Gen. Phan.* 122; O. Kuntze, *Rev. Gen.* I, 234, Engler and Prantl, *Nat. Pflanz.* 3, V, 122 (Pax).Living species: 1-2; temperate and colder regions. 25 sp. (Hegelmaier); N. America, 11 (*Morong*); E. Sts., 4; S. Sts., 5; Canada, 4; Pac. coast, 6-7; Rocky mts., 4.**Stellaria verna** (LINN.).*Callitriche verna* LINN. Fl. Suec. ed. II, 2 (1755).*Stellaria vernalis* WIGG. Prim. Holst. (—).*Callitriche heterophylla* PURSH, Fl. Am. 3 (1814).*C. vernalis* KOCH, Syn. ed. I, 245 (1837).? *C. asagrayi* HEGELM. Mon. Call. 54 (1864).? *C. stenocarpa* HEGELM. Verh. Bot. Brand. X, 114 (1868?).? *C. bolanderi* HEGELM. Verh. Bot. Brand. X, 114 (1868?).

Wats. and Coult., Gray's Man. 6 ed. 182; Britt., Fl. N. J. 106; Coult., Fl. Colo. 328; Wats., Fl. Calif. II, 77; Chap., Fl. S. St. 399; Upham, Fl. Minn. 122; Hook., Fl. Gt. Brit. 152; Herd., Fl. Eur. Russ. 52; Mac., Fl. Can. I, 530; Morong, Torr. Bull. XVIII, 236; Roth., Wheel. Exp. 119; Wats., King. Exp. 102; Cov., Fl. Ark. 182; Engl. Pax, Nat. Pflanz. 3, V, 122; Led., Fl. Ross. II, 121; Hart., Fl. Scand. I, 382; Greene, Fl. Fran. 229.

Europe; all Asia; circumboreal and in S. America.

North America: Most abundant in northern and Canadian waters; but occurring throughout the continent.

Minn. valley: N. districts; infrequent; aquatic in lakes or pools.

HERB.: *Bailey* 367, Mud river; *Roberts* 121, Stewart river; *Bailey* 400, Mud lake.**LX. ANACARDIACEAE. Cashew Family.**Endlicher, *Gen. Pl.* 1127 (1840); Benth. and Hook., *Gen. Pl.* I, 415 (1862); Baillon, *Hist. Pl.* V, 257 (1874)—*Terebinthaceae*, in part.*Genera*: 50±; tropical and subtropical regions; sparingly in temperate zones; trees or shrubs.*Species*: 600±; many in Central America.**RHUS LINN.** Gen. 241 (1737).**Anaphrenium** E. MEY. Herb. Drège.**Heeria** MEISSN. Gen. Comm. 55 (1843).**Lobadium** RAF. Journ. Phys. LXXXIX, 98 (1819).**Malosma** NUTT. ex Baillon, Hist. Pl. V, 321 (1874).**Metopium** P. BR. Jam. Hist. 177 (1756).**Ozoroa** DEL. Ann. Sci. Nat. Ser. 2, XX, 91 (1843).**Roemeria** THUNB. Fl. Cap. 194 (1809).**Turpinia** RAF. Med. Rep. II, hex 2, 352 (1808).**Styphonia** NUTT. T. and G. Fl. I, 220 (1838).**Schmalzia** DESVX. Jour. Bot. III, 229 (1809).

Cotinus and **Toxicodendron** TOURN. Inst. 610 (1700).

Lithraea MIERS. Trav. Chile, II, 529 (1826).

Vernix ADANS. Fam. Pl. II, 342 (1763).

Pocophorum NECK. Elem. II, 226 (1790).

Melanococca BLUME, Lug. Bat. I, 236 (1833).

Baillon, *Hist. Pl.* V, 321; Benth. and Hook., *Gen. Pl.* I, 418; Durand, *Ind. Gen. Phan.* 86; Gray, *Ill. Gen.* II, 157; Sargent, *N. Am. Silva* III, 1, 7; Schenck, *Palaeophyt.* 543.

Living species: 120±; principally at the Cape of Good Hope; also warmer extra-tropical regions, and a few in the tropics. Russia, 2; Europe, 4; N. America, 14; Canada, 7-9; W. Tex., 6; S. Sts., 9; Pl. Wheel., 6; E. Sts., 7; Calif., 4; Rocky mts., 3.

Fossil species: 30-40 spec. Cretaceous, N. Amer. (*Lesquereaux*) and Greenland (*Heer*); Tertiary Europe (*Saporta* and others); N. America (*Lesqx.*) and Asia.

Rhus radicans LINN. Spec. 266 (1753).

R. toxicodendron var. *radicans* TORR. Fl. U. S. 324 (1824).

R. toxicodendron AUCT. AMER. in part.

Wats. and Coult., Gray's Man. 6 ed. 119; Britt., Fl. N. J. 79; Chap., Fl. S. St. 69; Upham, Fl. Minn. 37; Webb., Fl. Neb. 121; Coult., Fl. Colo. 49; Mac., Fl. Can. I, 101; Nym., Fl. Eur.; Miyabe, Fl. Kur. 224; Coult., Fl. Tex. 68; Roth., Wheel. Exp. 84; Wats., King. Exp. 53; Cov., Fl. Ark. 173; Wats., Bibl. Ind. I, 183.

Saghalin, Japan and Kurile Isls.; intro. from East in Germany.

North America: N. S. to Saskatchewan; S. to N. Eng., N. J. and Fla.; W. to Dak., Colo., Ark. and Tex.

Minn. valley: Throughout; shores of lakes, low ground and edges of woods; abundant.

HERB.: *Taylor* 131, Janesville; *Taylor* 179 Janesville; *Ballard* 190, Jordan, Scott Co.; *Taylor* 546, Janesville; *Sheldon* 169, Madison Lake; *Ballard* 337, Jordan, Scott Co.; *Taylor* 624, Minnesota lake; *Sheldon* 1468, Pipestone City; *Sheldon* 884, Sleepy Eye; *Sheldon* 55, Elysian; *Ballard* 688, Waconia; *Kasube* 47, Minneapolis; *Holzinger* 45, Winona Co.

Rhus vernix LINN. Spec. 265 (1753).

Toxicodendron pinnatum MILL. Dict. ed. 8 (1768).

Rhus venenata DC. Prodr. II, 68 (1825).

Wats. and Coult., Gray's Man. 6 ed. 119; Chap., Fl. S. St. 69; Upham, Fl. Minn. 37; Britt., Fl. N. J. 79; Mac., Fl. Can. I, 100, 505; Wats., Bibl. Ind. I, 184; Sarg., N. A. Silv. III, 23.

North America, W. Ont. and N. N. Eng. to N. J., N. Car., N. Ga. and Alab.; W. to Minn., Ark. and W. La.

Minn. valley: Ft. Snelling and only far N. E.; swamps and springsides; rare.

Rhus copallina LINN. Spec. 266 (1753).

Wats. and Coult., Gray's Man. 6 ed. 119; Britt., Fl. N. J. 79; Chap., Fl. S. St. 69; Webb., Fl. Neb. 121; Upham, Fl. Minn. 37; Mac., Fl. Can. I, 100; Coult., Fl. Tex. 67; Cov., Fl. Ark. 173; Wats., Bibl. Ind. 182; Sarg., N. A. Silva III, 19.

North America: Thousand Islands, Can. to N. Eng., N. J. and Fla.; W. to Minn., Neb., Ark. and Rio Grande river; Cuba.

Minn. valley: Forest district, Ft. Snelling to Blue Earth Co.; rare; hillsides and dry banks.

HERB.: ? *Sandberg 112*, Cannon Falls.

Rhus glabra LINN. Spec. 265 (1753).

R. carolinense MARSH. Arbust. 129 (1785).

R. elegans AIT. Hort. Kew. I, 366 (1789).

Wats. and Coult., Gray's Man. 6 ed. 119; Britt., Fl. N. J. 79; Webb., Fl. Neb. 121; Coult., Fl. Colo. 49; Chap., Fl. S. St. 69; Upham Fl. Minn. 37; Mac., Fl. Can. I, 100, 505; Wats., King Exp. 52, 419; Roth., Wheel. Exp. 84; Cov., Fl. Ark. 173; Wats., Bibl. Ind. I, 182.

North America: N. S. to Ont., Man. and Saskatchewan?; S. to N. Eng., N. J., Fla. and Miss.; W. to Minn., Colo., Neb. and Ark.; Arizona.

Minn. valley: Throughout; rocky and dry situations, especially banks and hillsides.

HERB.: *Taylor 524*, Janesville; *Taylor 820*, Glenwood; *Ballard 84n*, Chaska; *Sheldon 1513*, Lake Benton; *Oestlund 24*, Minneapolis; *Bailey 230*, Vermilion lake; *Bailey 254*, Vermilion lake; *Holzinger 44*, Winona Co.; *Herb. Sheld. 1917*, Minneapolis; *Herb. Moyer 48*, Montevideo.

Rhus typhina LINN. Amoen. IV, 311 (1759).

Datisca hirta LINN. Spec. 1037 (1753).

Rhus hypselodendron MOENCH, Meth. 73 (1794).

R. typhina var. *arborescens* WILLD. Enum. 323 (1809).

R. typhina var. *frutescens* WILLD. l. c.

R. hirta per legem, not Harv.

Wats. and Coult., Gray's Man. 6 ed. 119; Britt., Fl. N. J. 79; Upham, Fl. Minn. 37; Chap., Fl. S. St. 69; Mac., Fl. Can. I, 100; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 36; Cov., Fl. Ark. 73; Wats., Bibl. Ind. I, 184; Sarg., N. A. Silva III, 15.

Introduced in Europe.

North America: N. S.?, N. B., Ont., W. of Lake Huron and Minn.; S. to N. Eng., N. J., N. Car., Alab., Miss.; W. to Mo. and Ark,

Minn. valley: E. portion of valley and N. edge to central region; rocky hillsides and banks.

HERB.: *Taylor 448*, Janesville; *Taylor 448½*, Lake Helena, Waseca Co.; *Sheldon 383*, Madison Lake; *Ballard 116*, Chaska; *Holzinger 43*, Winona Co.

LXI. CELASTRACEAE. Staff-Tree Family.

Endlicher, *Gen. Pl.* 1085 (1836-40); Benth. and Hook., *Gen. Pl.* I, 357 (1862) *excl. Hippocrateae*; Baillon, *Hist. Pl.* VI, 1 (1877).

Genera: 35 ±; tropical regions and less abundantly in temperate.

Species: 250 ± living; several (10-15) fossil.

EVONYMUS LINN, Gen. 79 (1737).

Vyenomus PRESL, Bot. Bem. 32 (1844).

Melanocarya TURCZ. Bull. Mosq. XXXI, I, 453 (1860).

Baillon, *Hist. Pl.* VI, 30; Benth. and Hook., *Gen. Pl.* I, 360; Durand, *Ind. Gen. Phan.* 65; Gray, *Ill. Gen.* II, 187; Schenck, *Palaeophyt.* 578; Sargent, *N. Am. Silv.* II, 9.

Living species: 40+; Northern hemisphere to Mexico; Malay archipelago and N. Australia; centers in N. E. India, China and Japan. North America, 6-7; Mexico, 4-5; W. Tex., 1; Calif., 1; E. Sts., 2; S. Sts., 2; Russia, 6; Europe, 3; Russian Europe, 3.

Fossil species: Greenland and N. Europe; Tertiary.

Evonymus atropurpureus JACQ. Hort. Vind. II, 55 (1772).

E. caroliniensis MARSH. Arbust. 43 (1785).

E. latifolius MARSH. Arbust. 44 (1785).

Wats. and Coult., Gray's Man. 6 ed. 110; Britt., Fl. N. J. 75; Webb., Fl. Neb. 122; Chap., Fl. S. St. 76; Upham, Fl. Minn. 39; Mac., Fl. Can. I, 95; Cov., Fl. Ark. 172; Wats., Bibl. Ind. I, 161.

North America: Ont. and N. Y. to N. J. and Fla.; W. to Minn., Neb., Dak., Kan., Ark. and Miss.

Minn. valley: Throughout, E. of the Pomme des Terres river; wooded banks and shores of lakes.

HERB.: *Sheldon* 221, Madison Lake; *Sheldon* 622, Wilton, Waseca Co.; *Roberts* 23, Lake Lilian; *Herrick* 67, Minneapolis; *Sandberg* 116, Vasa; *Kassube* 51, Minneapolis; *Herb. Moyer* 50, Chippewa river, near Montevideo.

CELASTRUS LINN. Gen. 168 (1737).

Denhamia MEISSN. Gen. 18 (1836).

Gymnosporia WIGHT. and ARN. Prodr. I, 159 (1834).

Maytenus FEUILL. ex Juss. Gen. 449 (1789).

Putterlickia ENDL. Gen. 1086 (1840).

Catha ENDL. Gen. 5678 (1840).

Eucentrus and **Polyacanthus** PRESL, Bemerk. 33 (1844).

Scytophyllum S. and Z. Enum. I, 124 (1837).

Orixa THUNB. Fl. Jap. 3 (1784).

Leucocarpon A. RICH. Sert. Astrol. 46 (1832).

? **Hedraianthera** F. MULL. Frag. V, 58 (1882).

Cassine HARV. and SOND. Fl. Cap. I, 452, 465 (1863).

Haenkea R. and P. Prodr. 36 (1798).

Monteverdia RICH. Cub. I, 346 (1850).

? **Moya** GRIS. Pl. Lorenz. 63 (1874).

Maiten FUEILL. Obs. III, 39 (1714).

Baillon, *Hist. Pl.* VI, 46; Benth. and Hook., *Gen. Pl.* I, 364, 365, 366; Durand, *Ind. Gen. Phan.* 66; Gray, *Ill. Gen.* II, 185; Schenck, *Palaeophyt.* 580.

Living species: $135 \pm$; 18 (*B. and H.*); cosmopolitan; centers in tropics. North America: Canada, 1; E. Sts., 1; S. Sts., 1; S. Tex., 2.

Fossil species: Cretaceous, Upper and Lower (*Lesquereaux, Fontaine*), N. and S. America, Alaska, Greenland (*Heer*); Australia (*Ettinghausen*); Tertiary: *Celastrorhynchium* Göppert—Europe; Potomac.

Celastrus scandens LINN. Spec. 196 (1753).

C. bullatus LINN. Spec. 196 (1753).

Evonymoides scandens MOENCH, Meth. 70 (1794).

Wats. and Coult., Gray's Man. 6 ed. 110; Britt., Fl. N. J. 76; Upham, Fl. Minn. 39; Webb., Fl. Neb. 122; Chap., Fl. S. St. 77; Mac., Fl. Can. I, 94, 503; Wats., Bibl. Ind. I, 161.

North America: Q., Ont., L. Superior region to Man. and Assiniboia; S. to N. Eng., N. J. and N. Car.; W. to Minn., Neb. and Kan.

Minn. valley: Throughout; banks of streams and in thickets; climbing over underbrush; common.

HERB.: *Taylor 1009*, Glenwood; *Taylor 898*, Glenwood; *Sheldon 1488*, Pipestone City; *Taylor 1165*, Glenwood; *Taylor 35*, Elysian; *Taylor 126*, Janesville; *Sheldon 918*, Sleepy Eye; *Ballard 85*, Chaska; *Kassube 50*, Cedar lake; *Bailey 235*, Vermilion lake; *Holzinger 46*, Winona Co.; *Herb. Sheld. 1771*, Ft. Snelling; *Herb. Moyer 262*, Chippewa Co.

LXII. AQUIFOLIACEAE. Holly Family.

Endlicher, *Gen. Pl.* 1092 (1836-40)—*Illicineae*; Benth. and Hook. *Gen. Plant.* I, 355 (1862); Baillon, *Hist. Pl.* XI, (1892).

Genera: 3-4; principally in tropics, a few extra-tropical.

Species: $150 \pm$; 145 in *Ilex*. Almost all Central American but some extending through all temperate and tropical regions. A few fossil leaves from Tertiary of Greenland, referred here.

ILEX LINN. Gen. 91 (1737), p. p. Benth. l. c. (1862).

Prinos LINN. Gen. 441 (1737).

Paltoria RUIZ and PAV. Fl. Peruv. I, 54 (1798).

Macoucoua AUBL. Pl. Gui. I, 88 (1775).

Chomelia VELLOZ. Flum. I, 106 (1827).

Pileostegia TURCZ. Bull. Mosc. XXXII, 276 (1859).

Leucodermis PLANCH. Herb. Hook.

Byronia ENDL. Ann. Wien. I, 184 (1835).

Polystigma MEISSN. Gen. 252 (1843).

Benth. and Hook., *Gen. Pl.* I, 356; Durand, *Ind. Gen. Phan.* 65; Schenck, *Palaeophyt.* 580; Baillon, *Hist. Pl.* XI, (1892).

Living species: 175±; cosmopolitan. Centers in Brit. Guiana and Brazil; very infrequent in Africa and Australia; 13-14, E. North America. S. Sts., 12; E. Sts., 9; Canada, 4.

Fossil species: Tertiary, Greenland and Alaska (Heer).

Ilex verticillata (LINN.) GRAY, Man. 5 ed. 307 (1867).

Prinos verticillatus LINN. Spec. 330 (1753).

P. confertus MOENCH, Meth. 481 (1794).

P. gronovii MICHX. Fl. N. Am. II, 236 (1803).

Wats. and Coult., Gray's Man. 6 ed. 109; Britt., Fl. N. J. 75; Upham, Fl. Minn. 95; Chap., Fl. S. St. 270; Mac., Fl. Can. I, 93; Cov., Fl. Ark. 172; Wats., Bibl. Ind. I, 160.

North America: N. S. to C. Ont. and Minn.; S. to N. Eng., N. J. and Fla.; W. to Ill., Iowa, Mo. and Ark.

Minn. valley: Reported from the N. edge but somewhat doubtful, low woodland.

HERB.: Sandberg 388, Marine Mills; Herrick 188, St. Louis river.

LXIII. STAPHYLEACEAE. Bladder-Nut Family.

Endlicher, *Gen. Pl.* 1084 (1836-40); Bentham and Hooker, *Gen. Pl.* I, 392 (1862)—sub *Sapindaceae*; Baillon, *Hist. Pl.* V, 392.

Genera: 2; N. extra-tropical region.

Species: 15±; principally in Chinese-Japanese region and E. India. Fossils from Green river Tertiary, Wyoming.

STAPHYLEA LINN. Gen. 248 (1737).

Bumalda THUNB. Fl. Jap. 8 (1784).

Staphylodendron TOURN. Inst. 616 (1700).

Baillon, *Hist. Pl.* V, 392; Benth. and Hook., *Gen. Pl.* I, 412; Durand, *Ind. Gen. Phan.* 83; Schenck, *Palaeophyt.* 554; Gray, *Ill. Gen.* II, 181.

Living species: 4; 1, Europe; 2, N. America; 1, Himalayas and Japan; Atl. states, 1; Pac. America, 2.

Fossil species: 1, Green river group, Tertiary, N. America (*Lesquereaux*).

Staphylea trifolia LINN. Spec. 270 (1753).

Staphylodendrum trifoliatum MOENCH, Meth. 64 (1794).

Wats. and Coult., Gray's Man. 6 ed. 118; Chap., Fl. S. St. 77; Britt., Fl. Neb. 78; Upham, Fl. Minn. 39; Webb., Fl. Neb. 122; Mac., Fl. Can. I, 98; Cov., Fl. Ark. 173; Wats., Bibl. Ind. I, 181

North America: Q., Ont. to Georgian bay; S. to N. Eng., N. J., Car. and Tenn.; W. to Minn., Neb. and Ark.

Minn. valley: Forest region; Ft. Snelling to Blue Earth Co. and W. to New Ulm; edges of woods and shaded banks.

HERB.: *Sheldon* 313, Stony Point, Lake Madison; *Anderson* 1, Goodhue Co.; *Sheldon* 705, White Bear lake; *Sheldon* 553, Waseca; *Sheldon* 172, Eagle Lake, Blue Earth Co.; *Sheldon* 628, Wilton, Waseca Co.; *Holzinger* 47, Winona Co.; *Sandberg* 117, Cannon Falls; *Herb. Wickersheim* 28, Mankato.

LXIV. ACERACEAE. Maple Family.

Endlicher, *Gen. Pl.* 1055 (1840); Bentham and Hooker, *Gen. Pl.* I, 388 (1862)—sub *Sapindaceae*; Baillon, *Hist. Pl.* V, 373 (1874)—sub *Sapindaceae*.

Genera: 2; temperate N. hemisphere to Java and N. India.

Species: 60±; center in Himalayan region; 55 in *Acer*.

ACER LINN. Gen. 317 (1737).

Negundo MOENCH, Meth. 334 (1794).

Negundium RAF. Med. Rep. II, V, 350 (1808).

Baillon, *Hist. Pl.* V, 427; Benth. and Hook., *Gen. Pl.* I, 409; Gray, *Ill. Gen.* II, 199; Durand, *Ind. Gen. Phan.* 82; Schenck, *Palaeophyt.* 557; Sargent, *N. Am. Silv.* II, 79.

Living species: 75±; China and Japan, 30±; Himalayas, 12; Europe and Orient, 12; North America, 9; E. Sts., 6; Pac. coast, 3; Rocky mts., 2; Canada, 9; Pl. Wheel., 4; Pl. King., 4; northern hemisphere and S. to mts. of Java.

Fossil species: Greenland and Spitzbergen, Tertiary (*Heer*); Cretaceous, N. America (*Lesquereaux*, *Newberry*); Tertiary Europe, 5 sp.; principally Oligocene, few Miocene; Miocene of Saghalin; Pliocene in Japan (*Nathorst*). Tertiary, N. America, numerous.

Acer negundo LINN. Spec. 1056 (1753).

Negundo aceroides MOENCH, Meth. 334 (1794).

Negundium fraxinifolium RAF. Desv. Jour. Bot. V, 170 (1809).

Negundo fraxinifolium NUTT. Gen. I, 253 (1818).

? *N. mexicanum* DC. Prodr. I, 596 (1824).

N. trifoliatum and *lobatum* RAF. N. Fl. I, 48 (1830).

N. negundo SUDW. Gard. and For. IV, 166 (1891).

Wats. and Coult., Gray's Man. 6 ed.; Britt., Fl. N. J. 78; Coult., Fl. Colo. 49; Brew. and Wats., Fl. Calif. I, 108; Chap., Fl. S. St. 81; Upham, Fl.

Minn. 40; Webb., Fl. Neb. 120; Mac., Fl. Can. I, 100, 504; Coult., Fl. Tex. 66; Wats., King Exp. 52; Roth., Wheel. Exp. 42, 84, 357; Cov. Fl. Ark. 173; Wats., Bibl. Ind. I, 180.

North America: Saskatchewan to Man. and Toronto; N. Eng., N. J. to Fla.; W. to Mont., Dak., Neb., Colo., Utah and Tex.; Arizona; also on Pac. coast in a well-marked variety; N. Mex., Mexico.

Minn. valley: Forest district and along river banks, throughout; moist woods and shores of lakes.

HERB. *Sheldon* 1099, Springfield; *Sheldon* 162, Madison Lake; *Taylor* 73, Elysian; *Taylor* 157, Janesville; *Oestlund* 26, Minneapolis; *Holzinger* 49, Winona Co.; *Kassube* 52, Minneapolis; *Oestlund* 27, Hennepin Co.; *Sandberg* 122, Cannon Falls.

***Acer rubrum* LINN.** Spec. 1055 (1753).

? *A. glaucum* MARSH. Arbust. Amer. 2 (1785).

? *A. carolinianum* WALT. Fl. Car. 251 (1788).

A. coccineum MICHX. f. Arb. Am. II, 203 (1810).

A. sanguineum SPACH, Ann. Sci. Nat. II, 2, 176 (1834).

A. microphyllum and *semiorbiculatum* PAX, Engl. Jahrb. VII, 181 (1888).

Wats. and Coult., Gray's Man. 6 ed. 118; Britt., Fl. N. J. 78; Chap., Fl. S. St. 81; Upham, Fl. Minn. 40; Mac., Fl. Can. I, 99; Cov., Fl. Ark. 173; Wats., Bibl. Ind. I, 176; Sarg., Silva, II, 107; Upham, Suppl. Minn. 50.

North America: Lat. 49° N. in N. Br., Q. and Ont. to S. Fla., W. Man., Dak., Ark., Ind. Terr. and Tex.

Minn. valley: Forest district; reported from Redwood Falls; swampy woodland and river banks.

HERB.: *Bailey* 186, Vermilion lake; *Sandberg* 121, Goodhue Co.

***Acer barbatum* MICHX.** Fl. N. Am. II, 252 (1803).

A. saccharinum WANG. Amer. Holz. 26 (1787) *not* Linn.

A. saccharophorum KOCH, Hort. Dendr. 80 (1853).

A. saccharum BRITT. Fl. N. J. 78 (1890) *not* Marsh.

Wats. and Coult., Gray's Man. 6 ed. 117; Upham, Fl. Minn. 39; Chap., Fl. S. St. 80; Mac., Fl. Can. I, 99; Cov., Fl. Ark. 173; Wats., Bibl. Ind. I, 176; Sarg., Silva, II, 97.

North America: Newf. and N. S. to Man.; S. to Maine, N. J. and Va.; W. to Minn., Neb.? and Tex.

Minn. valley: Forest district, Ft. Snelling to Brown Co. and W. to the Chippewa river; rich woods and along streams.

HERB.: *Ballard* 120, Chaska; *Sheldon* 297, Madison Lake; *Sheldon* 808, Sigel township, Brown Co.; *Taylor* 159, Janesville; *Holzinger* 48, Winona Co.; *Sandberg* 119, Vasa;

Sandberg 120, Winona Co.; *Bailey* 225, Vermilion lake; *Herb. Sheld.* 1860, Minneapolis.

***Acer barbatum* MICHX. var. *nigrum* (MICHX. f.) SARG.** Gard. and For. II, 364 (1888).

Acer nigrum MICHX. f. Arbr. Amer. II, 238 (1810).

A. saccharinum var. *nigrum* T. and G. Fl. I, 248 (1838).

A. saccharum var. *nigrum* BRITT. Cat. N. J. 78 (1890).

Wats. and Coult., Gray's Man. 6 ed. 117; Upham, Fl. Minn. 40; Mac., Fl. Can. I, 99; Cov., Fl. Ark. 173; Wats., Bibl. Ind. I, 176; Sarg., Silva, II, 99.

North America: Ont., Vt., N. J. to Alab. and Miss.; W. to Minn., Kan. and Ark.

Minn. valley: Reported from Le Sueur Co., and probably occurring S. E. and S.

***Acer saccharinum* LINN.** Spec. 1055 (1753).

A. saccharum MARSH. Arbust. Amer. 4 (1785).

A. rubrum LAUTH. De Acer. 11 (1781).

A. dasycarpum EHRH. Beitr. IV. 24 (1789).

A. rubrum var. *pallidum* AIT. Hort. Kew. III, 434 (1789).

A. eriocarpum MICHX. Fl. N. Am. II, 253 (1803).

Wats. and Coult., Gray's Man. 6 ed. 117; Britt., Fl. N. J. 78; Chap., Fl. S. St. 81; Upham, Fl. Minn. 40; Webb., Fl. Neb. 122; Mac., Fl. Can. I, 99; Cov., Fl. Ark. 173; Wats., Bibl. Ind. I, 175; Sarg., Silva, II, 103.

North America: N. Br. and Ont. to N. J. and Fla.; W. to Dak., Neb., Kan., Ark. and Ind. Terr.

Minn. valley: Throughout, especially in forest district; banks of streams and shores of lakes.

HERB.: *Sheldon* 468, Madison Lake; *Bailey* 109, Vermilion lake; *Herb. Moyer* 51, Montevideo.

***Acer spicatum* LAM.** Enc. Meth. II, 381 (1786).

A. pennsylvanicum DU ROI, Diss. 61 (1771).

A. parviflorum EHRH. Beitr. IV, 25, 26, 40 (1789).

A. montanum AIT. Hort. Kew. III, 435 (1789).

Wats. and Coult., Gray's Man. 6 ed. 117; Chap., Fl. S. St. 80; Britt., Fl. N. J. 78; Upham, Fl. Minn. 39; Mac., Fl. Can. I, 98; Miyabe, Fl. Kur. 223 in var.; Wats., Bibl. Ind. I, 177; Sarg., Silv. II, 83.

North America: Newf. and N. S. to Man. and Saskatchewan; S. in Appalachians to Ga.; W. to Minn. and Ky. There is a variety, scarcely to be separated from the type, which occurs from Japan and Saghalin to Manchuria.

Minn. valley: Local; bluffs, near Ft. Snelling; lower levels, in woods.

HERB.: *Herrick* 68, St. Louis river; *Roberts* 24, Duluth; *Bailey* 228, Vermilion lake; *Sandberg* 118, Tower; *Manning* 1, Lake City.

Acer pennsylvanicum LINN. Spec. 1055 (1753).*A. canadense* MARSH. Arbust. 3 (1785).*A. striatum* DU ROI, Diss. 58 (1771).

Wats. and Coult., Gray's Man. 6 ed. 117; Britt., Fl. N. J. 77; Chap., Fl. S. St. 80; Upham, Fl. Minn. 39; Mac., Fl. Can. I, 98; Wats., Bibl. Ind. I, 175.

North America: N. S., N. Br., Q., Ont. to L. Superior; S. to N. Eng., N. J., Ga., Ky., Mo.; W. to Minn.

Minn. valley: Local; bluffs, near Ft. Snelling.

LXV. BALSAMINACEAE. Balsam Family.

Endlicher, *Gen. Pl.* 1173 (1836-40); Bentham and Hooker, *Gen. Plant.* 1, 269 (1862)—sub *Geraniaceae*; Baillon, *Hist. Pl.* V, 39 (1874)—sub *Geraniaceae*.

Genera: 1-2; Tropical Asia and a few in N. temperate floral region and in Africa.

Species: 225±; center in tropical Asia.

IMPATIENS LINN. Gen. 680 (1737).**Balsamina** GAERTN. Fruct. II, 151 (1791).**Hydrocera** BLUME, Bijdr. 241 (1826).**Tytonia** DON, Syst. I, 749 (1831).

Baillon, *Hist. Pl.* V, 39; Benth. and Hook., *Gen. Pl.* I, 277, 278, 989; Durand, *Ind. Gen. Phan.* 53; Gray, *Ill. Gen.* II, 133.

Living species: 225±; 135 (B. and H.); North America, 2; N. Europe and Asia, 3; Africa and Madagascar, 23; all the others in tropical Asia.

Impatiens biflora WALT. Fl. Car. 219 (1788).*I. maculata* MUHL. Cat. 26 (1813).*I. fulva* NUTT. Gen. I, 146 (1818).*I. nolitangere* var. *B.* MICHX. Fl. N. Am. II, 149 (1803).

Wats. and Coult., Gray's Man. 6 ed. 106; Britt., Fl. N. J. 74; Webb., Fl. Neb. 121; Upham, Fl. Minn. 36; Chap., Fl. S. St. 65; Mac., Fl. Can. I, 62, 502; Cov., Fl. Ark. 171; Wats., Bibl. Ind. I, 152.

North America: Throughout Can. to lat. 66° N. and Alaska; S. to New Eng. and Fla.; W. to Minn., Dak., Neb. and Ark.

Minn. valley: Throughout, but particularly in the forest district; damp places and edges of swamps; springs.

HERB.: *Sheldon* 1043, Sleepy Eye; *Taylor* 984, Glenwood; *Sheldon* 27, Elysian; *Sheldon* 1311, Lake Benton; *Ballard* 709, Waconia; *Ballard* 868, Waconia; *Ballard* 753, Waconia; *Ballard* 851, Patterson's lake; *Herrick* 59, Minnetonka; *Herrick* 60, Excelsior; *Herrick* 61, Minneapolis; *Oestlund* 22, Hennepin Co.; *Herrick* 62, Minneapolis; *Arthur* 7, Vermilion lake; *Roberts*

21, Beaver bay; *Bailey* 118, Vermilion lake; *Sandberg* 108, Red Wing; *Herb. Moyer* 45, Montevideo.

***Impatiens aurea* MUHL.** Cat. 26 (1813).

I. nolitangere MICHX. Fl. N. Am. II, 149 (1803) not Linn.

I. pallida NUTT. Gen. I, 146 (1818).

Wats. and Coult., Gray's Man. 6 ed. 106; Britt., Fl. N. J. 73; Webb., Fl. Neb. 121; Chap., Fl. S. St. 65; Upham, Fl. Minn. 36; Mac., Fl. Can. I, 92; Cov., Fl. Ark. 171; Wats., Bibl. Ind. 152; Brew. and Wats., Fl. Calif. I, 93.

North America: Ont. to Saskatchewan and Washington; S. to N. Eng., N. J. and Ga.; W. to Minn., Dak., Neb., Ark.

Minn. valley: Forest district to Blue Earth Co. and W. to the Chippewa river; rich, damp places; springs.

HERB.: *Taylor* 277, Janesville; *Ballard* 896, Waconia; *Taylor* 1160, Glenwood; *Herrick* 58, Minnetonka; *Sandberg* 107, Goodhue Co.; *Herb. Moyer* 44, Montevideo.

LXVI. RHAMNACEAE. Buckthorn Family.

Endlicher, *Gen. Pl.* 1094 (1836-40); Bentham and Hooker, *Gen. Plant* I, 371 (1862); Baillon, *Hist. Pl.* VI, 51 (1877).

Genera: 40±; tropical and warmer regions.

Species: 500±: fossil, 10-12 (*Tertiary*).

CEANOTHUS LINN. Act. Ups. 77 (1741).

***Paliurus* ADANS.** Fam. Pl. II, 304 (1763) *in part*.

***Forrestia* RAF.** Med. Rep. II, hex. V, 350 (1808).

Baillon, *Hist. Pl.* VI, 80; Benth. and Hook., *Gen. Pl.* I, 378; Durand, *Ind. Gen. Phan.* 69; Sargent, *N. Am. Silva*, II, 41; Gray, *Ill. Gen.* II, 181; Schenck, *Palaeophyt.* 588.

Living species: 40±; N. America, western, temperate and tropical. Centers on Pac. coast. 19-22, California; 4, Rocky mts.; Canada, 4; S. Sts., 3; E. Sts., 2; Pl. King, 6; Pl. Wheel., 4; W. Tex., 4; Mexico and Central America, ±15.

Fossil species: 2; Java, Tertiary (*Göppert*); Bonn, Germany (*Weber*), Tertiary.

***Ceanothus ovatus* DESV.** Arb. II, 381 (1809).

C. ovalis BIGEL. Fl. Bost. ed. 2, 92 (1824).

C. intermedius HOOK. Fl. Bor.-Am. I, 124 (1833).

Wats. and Coult., Gray's Man. 6 ed. 112; Upham, Fl. Minn. 39; Webb., Fl. Neb. 122; Coult., Fl. Colo. 47; Mac., Fl. Can. I, 96; II, 314; Coult., Fl. Tex. 60; Wats., Bibl. Ind. I, 165.

North America, Ont. and L. Huron and L. Superior region to N. Eng., Ill., Minn., Dak., Neb., Colo., Wyoming and W. Tex.

Minn. valley: local; New Ulm; rare; sandy ridges and rocks.

Ceanothus americanus LINN. Spec. 195 (1753).

C. trinervus MOENCH, Meth. 651 (1794).

C. herbaceus RAF. Med. Repos. V, 360 (1808).

C. perennis and *intermedius* PURSH, Fl. Am. 167 (1814).

C. sanguineus NUTT. Gen. I, 153 (1818).

C. officinalis RAF. Med. Bot. II, 205 (1830).

Wats. and Coult., Gray's Man. 6 ed. 112; Britt., Fl. N. J. 77; Upham, Fl. Minn. 39; Webb., Fl. Neb. 122; Chap., Fl. S. St. 74; Mac., Fl. Can. I, 95; Coult., Fl. Tex. 60; Cov., Fl. Ark. 172; Wats., Bibl. Ind. I, 163.

North America: Ont. to Man.; S. to N. Eng., N. J. and Fla.; W. to Minn., Neb., Ark., Miss. and W. Tex.

Minn. valley: Throughout; dry and open woodland and along river banks.

HERB.: *Sheldon* 1171, New Ulm; *Ballard* 740, Waconia; *Sheldon* 931, Redwood Falls; *Ballard* 465, Prior's lake, Scott Co.; *Sheldon* 734, Sleepy Eye; *Ballard* 566, Prior's lake, Scott Co.; *Herrick* 66, Minneapolis; *Kassube* 49, Rocky lake; *Sandberg* 115, Red Wing.

RHAMNUS LINN. Gen. 165 (1737) em.

Alaternus TOURN. Inst. 595 (1700).

Frangula MOENCH, Meth. Suppl. 271 (1802).

Marcorella NECK. Elem. 799 (1790).

Cardiolepis RAFIN. Neogen, 2 (1825).

Sciadophila PHIL. Linn. XXVIII, 618 (1854).

Rhamnella MIQ. Ann. Mus. Lugd.-Bat. III, 30 (1857).

Microrhamnus MAXIM. Mem. Ac. Petr.

Benth. and Hook., Gen. Pl. I, 377; Baillon, Hist. Pl. VI, 74; Durand, Ind. Gen. Phan. 68; Schenck, Palaeophyt. 585.

Living species: 70±; temperate regions of Europe, Asia and America; a few in the tropics; absent from Africa, Australia and Oceanica. N. America, 6-7; E. Sts., 3, W. Sts., 3-4.

Fossil species: Upper Cretaceous and Tertiary; Greenland, W. America, Siberia, Europe, Azores, Switzerland, Java; 15-20 sp. (*Lesquereaux*, *Heer*, *Göppert*).

Rhamnus alnifolia L'HER. Sert. Angl. 5 (1788).

R. franguloides MICHX. Fl. Am. I, 153 (1803).

R. alpinus RICH. Frankl. Journ. 6 (1823).

Girtanneria alnifolia and *franguloides* RAF. Fl. Tellur. 28 (1836).

Wats. and Coult., Gray's Man. 6 ed. 111; Britt., Fl. N. J. 76; Wats., Bibl. Ind. I, 168; Mac., Fl. Can. I, 96; Webb., Fl. Neb. 122; Upham, Fl. Minn. 38.

North America: N. Br., Maine, Ont., N. J., Penn. to Minn., Neb., Mont. and N. W. T. to Rocky mts.

Minn. valley: N. E. and N. districts; wooded banks and in forest.

HERB.: *Sheldon* 1928, Lake Calhoun; *Bailey* 457, Mud lake; *Kassube* 276, Minneapolis.

LXVII. VITACEAE. Vine Family.

Endlicher, *Gen. Pl.* 796 (1836-40)—*Ampelideae*; Benth. and Hook. *Gen. Pl.* I, 386; Lindl., *Veg. King.* 439 (1846).

Genera: 12±; temperate and tropical regions, less abundant in America.

Species: 260±; fossil species, 35-45-50; Cretaceous and Tertiary.

PARTHENOCISSUS PLANCH. Monog. Ampel. 446 (1887).

Ampelopsis MICHX. Fl. Bor.-Am. I, 159 (1803) *p. p.*

Quinaria RAF. ex Planch. 488 (1887).

Durand, *Ind. Gen. Phan.* 70; O. Kuntze, *Rev. Gen.* I, 125; Gray, *Ill. Gen.* II, 165; Schenck, *Palaeophyt.* 594; Benth. and Hook., *Gen. Pl.* I, 387.

Living species: 10; temperate Asia; E. N. America.

Fossil species: 1-2, Tertiary, N. America, Greenland?

Parthenocissus quinquefolia (LINN.) PLANCH. Monog. Ampel. I, 488 (1887).

Hedera quinquefolia LINN. Spec. 292 (1753).

Vitis hederacea EHRH. Beitr. Bot. I, 17 (1787).

V. quinquefolia LAM. Ill. II, 135 (1793).

Ampelopsis hirsuta DON, Cat. Cant. 166 (1796).

A. quinquefolia MICHX. Fl. N. Am. I, 160 (1803).

Cissus hederacea PERS. Syn. I, 143 (1805).

Ampelopsis hederacea DC. Prodr. I, 633 (1824).

Quinaria hederacea and *hirsuta* RAF. Med. Bot. II, 122 (1830).

Wats. and Coult., Gray's Man. 6 ed. 115; Britt., Fl. N. J. 77; Coult., Fl. Colo. 48; Chap., Fl. S. St. 72; Webb., Fl. Neb. 123; Upham, Fl. Minn. 38; Mac., Fl. Can. I, 97; Coult., Fl. Tex. 63; Roth., Wheel. Exp. 83; Cov., Fl. Ark. 173; Wats., Bibl. Ind. I, 170; Hart., Scand. Fl. I, 559.

North America: Q. to Man. and Assiniboia; S. to N. Eng., N. J. and Fla.; W. to Minn., Dak., Neb., Colo., Kan., Ark. and W. Tex.

Minn. valley: Throughout; banks of streams, climbing over shrubbery or on tree-trunks; frequent.

HERB.: ? *Taylor* 812, Glenwood; *Ballard* 90, Chaska; *Sheldon* 1581, Lake Benton; *Taylor* 786, Minnesota Lake; *Sheldon* 1607, Madison Lake; *Sandberg* 114, Red Wing; *Herb. Moyer* 49, Montevideo.

VITIS LINN. Gen. 161 (1737).

Planchon, *Mon. Amp.* 321; Benth. and Hook., *Gen. Pl.* I, 387; Durand, *Ind. Gen. Phan.* 70; Gray, *Ill. Gen.* II, 163; O. Kuntze, *Rev. Gen.* I, 125; Schenck, *Palaeophyt.* 593.

Living species: $30 \pm$; northern and temperate regions in both hemispheres. Russia, 1; Europe, 1; N. America, 15; S. Sts., 11; E. Sts., 8; Canada, 3; W. Tex., 8; Calif., 1; Rocky mts., 1; Pl. Wheel., 3.

Fossil species: Cretaceous, Europe and N. Amer.; Tertiary, Greenland (*Heer*); Wyoming (*Lesquereaux*); France (*Saporta* and *Marion*); Pliocene or Quat., Japan (*Nathorst*); older Tertiary, Japan (*Nathorst*); 25–30 sp. descr.

Vitis aestivalis MICHX. Fl. N. Am. II, 230 (1803).

V. laciniosa MARSH. Arbust. 165 (1785).

V. labrusca WALT. Fl. Car. 243 (1788).

V. palmata VAHL, Symb. III, 42 (1794).

V. vulpina JACQ. Hort. Schoenbr. IV, 13 (1804).

V. virginiana POIR. Enc. Meth. VIII, 608 (1810).

V. intermedia and *labruscoides* MUHL. Cat. 26 (1813).

Wats. and Coult., Gray's Man. 6 ed. 113; Britt., Fl. N. J. 77; Upham, Fl. Minn. 38; Webb., Fl. Neb. 123; Chap., Fl. S. St. 71; Mac., Fl. Can. I, 504; Coult., Fl. Tex. 62; Roth., Wheel. Exp. 83?; Cov., Fl. Ark. 172; Wats., Bibl. Ind. I, 171.

North America: Ont. along L. Erie to N. Eng., N. J. and S. to Fla.; W. to Minn., Neb., Ark., Miss. and Pecos river in Tex.

Minn. valley: Throughout but local; reported from Big Stone, Ft. Snelling and Worthington.

Vitis riparia MICHX. Fl. N. Am. II, 231 (1803).

V. vulpina LINN. Spec. 203 (1753) *in part*.

V. odoratissima DON, Cat. Cant. 66 (1796).

V. incisa JACQ. Hort. Schoenb. IV, 14 (1804).

V. cordifolia var. *riparia* GRAY, Man. 5 ed. 113 (1867).

Wats. and Coult., Gray's Man. 6 ed. 114; Britt., Fl. N. J. 77; Webb., Fl. Neb. 123; Chap., Fl. S. Sts. 71; Upham, Fl. Minn. 38; Mac., Fl. Can. I, 97, 504; Coult., Fl. Tex. 63; Cov., Fl. Ark. 172; Wats., Bibl. Ind. I, 173.

North America: N. S., N. Br. to Lake Winnipeg; S. to N. Eng., N. J. and Penn.; W. to Minn., Neb., Kan., Ark. and Tex.

Minn. valley: Throughout; less common than *V. cordifolia* Lam.; river banks and thickets.

HERB.: *Sheldon* 1333, Lake Benton; *Ballard* 30, Chaska; *Sheldon* 1485, Pipestone City; *Sheldon* 34, Elysian; *Herb. Moyer* 259, Montevideo.

Vitis cordifolia LAM. Ill. II, 134 (1793).*V. vulpina* MUHL. Cat. 26 (1813).*V. vulpina* var. *cordifolia* REGEL, Consp. Vit. 304 (1873).

Wats. and Coult., Gray's Man. 6 ed. 113; Britt., Fl. N. J. 77; Webb., Fl. Neb. 123; Upham, Fl. Minn. 38; Chap., Fl. S. St. 71; Mac., Fl. Can. I, 97; Coult., Fl. Tex. 63; Cov., Fl. Ark. 172; Wats., Bibl. Ind. 172.

North America: S. W. Ont.? to Maine.; S. to N. J. and Fla.; W. to Minn., Neb., Kan., Ark., Miss. and Tex.

Minn. valley: Forest region and banks of streams to Pommes des Terres river; river banks and shrubbery; common.

HERB.: *Sheldon* 364, Madison Lake; *Taylor* 712, Minnesota lake; *Sheldon* 1003, Sleepy Eye; *Sheldon* 984, Cross lake, Brown Co.; *Taylor* 488, Janesville; *Oestlund* 25, Hennepin Co.; *Kassube* 48, Minneapolis; *Sandberg* 113, Chisago Co.

LXVIII. TILIACEAE. Linden Family.

Endlicher, *Gen. Pl.* 1004 (1836-49); Benth. and Hooker, *Gen. Plant.* I, 228 (1862); Baillon, *Hist. Pl.* IV, 461 (1873); Schumann in *Engler and Prantl, Nat. Pflanz.* 3, VI, 8 (1890).

Genera: 35; distributed from two centers; (1) S. E. Asia; (2) Brazil (*Schumann*). Common in tropics; more abundant in N. hemisphere than in S.

Species: 375 ± living; 25 ± fossil in Tertiary rocks.

TILIA LINN. Gen. 440 (1737).

Baillon, *Hist. Pl.* IV, 185; Benth. and Hook., *Gen. Pl.* I, 236, 986; Durand, *Ind. Gen. Phan.* 45; Engler and Prantl, *Nat. Pflanz.* 3, VI, 24 (*Schumann*); Gray, *Ill. Gen.* II, 93; Schenck, *Palaeophyt.* 519.

Living species: 10; Northern hemisphere. Russia, 6; China and Japan, 6; Russian Europe, 5; Europe 5; North America, 5; Canada, 1-2; E. Sts., 3; S. Sts., 3; Mexico, 1; W. Tex., 1; not in California region, Central Asia or Himalayas.

Fossil species: 14-18 described from Alaska, Spitzbergen, Saghalin (*Heer*), Amur, Europe, Japan (*Nathorst*), Denmark, N. America (*Newberry* and *Lesquereaux*); Tertiary and Interglacial.

Tilia americana LINN. Spec. 514 (1753).*T. caroliniana* MILL. Dict. VIII, 4 (1768).*T. latifolia* SALISB. Prodr. 367 (1796).*T. pubescens* Nouv. Duham. I, 51 (1801)*T. glabra* VENT. Monog. Til. 9 (1802).*T. canadensis* MICHX. Fl. N. Am. I, 303 (1803).*T. stenopetala* RAF. Fl. Lud. 92 (1817).*T. neglecta* SPACH, Ann. Sci. Nat. 2, II, 340 (1834).

Wats. and Coult., Gray's Man 6 ed. 101; Webb., Fl. Neb. 120; Britt., Fl. N. J. 71; Chap., Fl. S. St. 59; Upham, Fl. Minn. 35; Mac., Fl. Can. I, 88; Engl. Nat. Pflanz. III, 6, 24; Coult., Fl. Tex. 46; Cov., Fl. Ark. 171; Wats., Bibl. Ind. I, 145; Sarg., Silva I, 49.

North America: N. B., Q., Ont., Man. to Assiniboia; S. to N. Eng., N. J. and Ga.; W. to Minn., Neb. and Tex.

Minn. valley: Throughout; especially in forest district, but on banks of streams; W. to Dakota line; rich soil.

HERB.: *Taylor* 485, Janesville; *Sheldon* 56, Elysian; *Sheldon* 654, Waseca; *Taylor* 662, Cobb river, Blue Earth Co.; *Taylor* 800, Glenwood; *Ballard* 555, Spring lake, Scott Co.; *Sheldon* 848, Sleepy Eye; *Sheldon* 389, Madison Lake; *Herrick* 53, Minneapolis; *Holzinger* 40, Winona Co.; *Bailey* 224, Vermilion lake; *Bailey* 249, Vermilion lake; *Sandberg* 101, Cannon Falls; *Herb. Wickersheim* 26, Lake Benton.

LXIX. MALVACEAE. Mallow Family.

Endlicher, *Gen. Pl.* 978 (1836-40); Bentham and Hooker, *Gen. Plant.* I, 195; Baillon, *Hist. Pl.* IV, 57 (1873)—*excl. Sterculiaceae*; Schumann in *Engler and Prantl, Nat. Pflanz.* 3, VI, 30 (1890).

Genera: 30 ±; cosmopolitan.

Species: 650-700; most abundant in tropics. A large number endemic in W. hemisphere.

MALVA LINN. *Gen.* 557 (1737).

Callirrhoe NUTT. *Jour. Phil. Acad.* II, 181 (1822).

Nuttallia BART. *Fl. Am.* II, 74 (1822).

Malvastrum DC. *Prodr.* I, 430 (1824).

Malvella JAUB. and SPACH, *Ill. Or.* V, 47 (1853).

Phyllanthophora GRAY, *Wilkes Exp.* I, 151 (1854).

Nototriche TURCZ. *ex Baill. Hist. l. c.* (1873).

Baillon, *Hist. Pl.* IV, 138; Benth. and Hook., *Gen. Pl.* I, 201; Engler and Prantl, *Nat. Pflanz.* 3, VI, 40, 41 (Schumann); Durand, *Ind. Gen. Phan.* 38; Gray, *Ill. Gen.* II, 49, 51, 59.

Living species: 100 ±; N. America, 25; rest in Cape of Good Hope region, Europe and Asia and N. Africa. Canada, 1; E. Sts., 4-5; S. Sts., 6; W. Tex., 10; rest Mexican, S-westward and Central America. S. America, 15-20 sp.

Malva triangulata LEAVENW. *Am. Jour. Sci.* VII, 62 (1823).

M. houghtonii T. and G. *Fl.* I, 225 and 681 (1838).

Callirhoë triangulata GRAY, *Pl. Fendl.* 16 (1849).

Wats. and Coult., Gray's Man. 6 ed. 98; Upham, *Fl. Minn.* 34; Chap., *Fl. S. St.* 53; Wats., *Bibl. Ind.* I, 133.

North America: Ind. to Minn.; S. to N. Car. and Alab.

Minn. valley: Prairie region on higher levels; far S. W.; dry and exposed hillsides; rare.

Malva involucrata (NUTT.) T. and G. Fl. I, 226 (1838).*Nuttallia involucrata* NUTT. T. Ann. Lyc. N. Y. II, 172 (1830).*Callirrhoe involucrata* GRAY, Pl. Lindh. 159 (1845).

Wats. and Coult., Gray's Man. 6 ed. 98; Webb. Fl. Neb. 121; Coult., Fl. Colo. 41; Cov., Fl. Ark. 170; Coult., Fl. Tex. 36; Wats., Bibl. Ind. I, 133.

North America: Minn. to Neb., Colo., Tex. and Ariz.

Minn. Valley: Reported from western edge.

NAPAEA LINN. Syst. VI, add. (1748).Baillon, *Hist. Pl.* IV, 139; Benth. and Hook., *Gen. Pl.* I, 201; Durand, *Ind. Gen. Phan.* I, 38; Gray, *Ill. Gen.* II, 55; Engler and Prantl, *Nat. Pflanz.* 3, VI, 41 (Schumann).

Living species: 1; North America.

Napaea dioica LINN. Spec. 686 (1753).*N. scabra* LINN. Mant. II, 435 (1774).*Sida dioica* CAV. Diss. I, 138 (1791).Wats. and Coult., Gray's Man. 6 ed. 98; Upham, Fl. Minn. 34; Engl. Schum., *Nat. Pflanz.* III, 6, 41; Wats., Bibl. Ind. I, 139.

North America: Penn. to Va.; W. to Minn. and Iowa.

Minn valley: S. E. district and to Martin Co.; rare; ravines and hillsides.

HERB.: *Sandberg 100*, Vasa.**HIBISCUS** LINN. Gen. 562 (1737).**Lagunaea**, **Triguera** CAV. Diss. 41, 173 (1791).**Trionum**, **Abelmoschus** MEDIC. ex DC. I, 446 (1824).**Bombycodendron** ZOLL. Hassk. Pl. Java 301 (1848).**Paritium** ST. HIL. Fl. Bras. Mer. I, 295 (1825).**Lagunaria** DON, Syst. I, 485 (1831).**Senra** CAV. Diss. II, 83 (1793).**Ketmia** TOURN. Inst. 99 (1700).**Hymenocalyx** ZENK. Pl. Ind. 8 (1835).**Dumreichera** HOCHST. Flora (1838).Baillon, *Hist. Pl.* IV, 139; Benth. and Hook., *Gen. Pl.* I, 207; Durand, *Ind. Gen. Phan.* 39; Engler and Prantl, *Nat. Pflanz.* 3, VI, 47, 48, 49 (Schumann); Gray, *Ill. Gen.* II, 81.

Living species: 165+; principally in the tropical and sub-tropical regions of the earth; Russia, 2; Europe, 2; Russian Europe, 2; N. America, 15; W. Tex., 3; S. Sts., 9; E. Sts., 3; Canada, 2; California, 2—4; Pl. Wheel., 1.

Hibiscus militaris CAV. Diss. I, 352 (1791).*H. laevis* SCOP. Del. Fl. III, 35 (1778).*H. virginicus* WALT. Fl. Car. 177 (1778) not Linn.*H. hastatus* MICHX. Fl. N. Am. II, 45 (1803).*H. riparius* PERS. Syn. II, 254 (1807).

Wats. and Coult., Gray's Man. 6 ed. 100; Upham, Fl. Minn. 34; Webb., Fl. Neb. 120; Chap., Fl. S. St. 58; Cov., Fl. Ark. 170; Wats., Bibl. Ind. I, 135

North America: Penn. to Minn. and Neb.; S. to Va. and Ark.

Minn. valley: Ft. Snelling; E. edge and N. E. district; rare; river banks and shore of lakes.

LXX. HYPERICACEAE. St. John's-Wort Family.

Endlicher, *Gen. Pl.* 1036 (1836-40); Bentham and Hooker, *Gen. Plant.* I, 163 (1862); Baillon, *Hist. Pl.* VI, 391 (1877).

Genera: 8; temperate and warmer regions.

Species: 225±; more abundantly represented in N. hemisphere than in S.

HYPERICUM LINN. Gen. 606 (1737).

Elodea, Elodes, Triadenia, Adenotrias, Drosanthe, Eremosporus, Webbia, Hypericum, Olympia, Campylopus, Psorophytum, Androsaemum, Eremanthe, Campylosporus, Norysca, Roscyna, Myriandra, Brathydium SPACH, *Ann. Sci. Nat. Ser. 2, V*, 353 (1836).

Androsaemum ALL. *Fl. Ped.* II, 47 (1785).

Brathrys MUT. ex Linn. f. *Suppl.* 43 (1781).

Sarothra LINN. *Gen. ed.* V, 344 (1754).

Tridia KORTH. *Hoev. and De Vr. Tijds.* III, 17 (1836).

Receveura VELL. *Fl. Flum.* V, 119, 120 (1826).

Baillon, *Hist. Pl.* VI, 391; Benth. and Hook., *Gen. Pl.* I, 165; Durand, *Ind. Gen. Phan.* 33; Gray, *Ill. Gen.* I, 213.

Living species: 175±; 160 (B. and H.); temperate and tropical regions; very numerous in N. temperate zone; very rare in S. temperate; Russia, 23; Europe, 41; Russian Europe, 10; N. America, 31; E. Sts., 17; Canada, 11; S. Sts., 25; Pl. King, 2; Pl. Wheel, 1; Mid. Calif., 3; Rocky mts., 1; W. Tex. 4.

Hypericum canadense LINN. *Spec.* 785 (1753).

H. thesiifolium HBK. *N. G. et. S.* V, 192 (1821).

H. pauciflorum HBK. l. c. (1821).

H. moranense HBK. l. c. (1821).

Wats. and Coult., *Gray's Man.* 6 ed. 95; Britt., *Fl. N. J.* 68; Upham, *Fl. Minn.* 31; Chap., *Fl. S. St.* 42; Cov., *Fl. Ark.* 169; Wats., *Bibl. Ind.* I, 125; Webb., *Appx. Neb.* 32.

North America: N. Y. to Fla.; W. to Wis., Minn., Neb. and Ark.

Minn. valley: N. E. district, and probably along N. edge; extending doubtfully to Blue Earth Co.; wet or damp woods and roadsides.

HERB.: *Ballard* 825, Page lake, Carver Co.; *Ballard* 856, Page lake; *Holzinger* 32, Winona Co.; *Bailey* 428, Long lake.

Hypericum gymnanthum ENGELM. and GRAY, Pl. Lindh. 4 (1845).

H. mutilum var. *gymnanthum* GRAY, Man. 5 ed. 86 (1867).

Wats. and Coult., Gray's Man. 6 ed. 95; Upham, Fl. Minn. 31; Britt., Fl. N. J. 68; Coult., Fl. Tex. 35; Cov., Fl. Ark. 170; Wats., Bibl. Ind. I, 127.

North America: N. J., Del. and Penn. to Minn. and Ark.; S. to Tex.

Minn. valley: N. E. district; low and shaded localities.

HERB.: *Roberts* 18, Stewart river.

Hypericum mutilum LINN. Spec. 787 (1753).

Ascyrum crux-andraea LINN. Spec. 787 (1753).

Hypericum quinquenervium WALT. Fl. Car. 190 (1788).

H. parviflorum WILLD. Spec. III, 1436 (1803).

H. stellarioides H. B. K. Nov. Gen. et. Spec. V, 196 (1821).

Brathrys quinquenervia SPACH, Ann. Sci. Nat. 2, V, 367 (1836).

Wats. and Coult., Gray's Man. 6 ed. 94; Britt., Fl. N. J. 68; Chap., Fl. S. St. 41; Upham, Fl. Minn. 31; Mac., Fl. Can. I, 85; Coult., Fl. Tex. 35; Wats., King Exp. 46; Cov., Fl. Ark. 170; Wats., Bibl. Ind. I, 127.

North America: N. S. to L. Winnipeg; E. U. S.; Tex. and Mexico; Minn. to Ark. and Eastward. Not in Neb., Colo. or Pac. coast region.

Minn. valley: Ft. Snelling and Waconia region; damp woodland.

HERB.: *Roberts* 17, Beaver bay; *Sandberg* 88, Goodhue Co.

Hypericum maculatum WALT. Fl. Car. 189 (1788).

H. virginianum WALT. Fl. Car. 189 (1788).

H. punctatum LAM. Enc. Meth. IV, 164 (1797).

H. micranthum CHOIS. Prodr. Hyper. 44 (1821).

Wats. and Coult., Gray's Man. 6 ed. 94; Britt., Fl. N. J. 68; Upham, Fl. Minn. 31; Chap., Fl. S. St. 40; Mac., Fl. Can. I, 85; Cov., Fl. Ark. 170; Wats., Bibl. Ind. I, 125.

North America: N. S., Q. to Ont.; S. to Maine, N. J., N. Car.; W. to Minn., Iowa, Mo. and Ark.

Hypericum prolificum LINN. Mant. 106 (1767).

H. foliosum JACQ. Hort. Schoen. III, 27 (1798).

Wats. and Coult., Gray's Man. 6 ed. 93; Chap., Fl. S. St. 39; Upham, Fl. Minn. 31; Cov., Fl. Ark. 170; Wats., Bibl. Ind. I, 128.

North America: N. J. to Mich. and Minn.; S. to Tenn.

Minn. valley: S. E. region, but doubtful; cool woods

Hypericum ascyron LINN. Spec. 1102 (1753).

H. pyramidatum AIT. Hort. Kew. III, 103 (1789).

H. ascyroides WILLD. Spec. III, 1443 (1803).

H. amplexicaule LAM. Enc. Meth. IV, 147 (1797).

H. macrocarpum MICHX. Fl. II, 82 (1803).

Wats. and Coult., Gray's Man. 6 ed. 93; Upham, Fl. Minn. 30; Britt., Fl. N. J. 67; Mac., Fl. Can. I, 84, 500; II, 312; Forbes and Hems., Fl. Sin. 72; Led., Fl. Ross. I, 446; Wats., Bibl. Ind. I, 128.

Altai and Baikal Siberia and China.

North America: Montreal, Q., Ont. to plains of the Saskatchewan; S. to N. Eng., N. J., Penn., and W. to Iowa, Minn. and Dak.

Minn. valley: Forest district and wooded banks; W. to Brown Co.; wooded banks of streams and cool ravines.

HERB.: *Sheldon* 1164, New Ulm; *Kassube* 33, Tuttle's creek, Hennepin Co.; *Herb. Sheld.* 1705, Minneapolis.

***Hypericum virginicum* LINN.** Spec. ed. 2, 1104 (1762).

H. campanulatum WALT. Fl. Car. 191 (1788).

H. emarginatum LAM. Enc. Meth. IV, 154 (1797).

Triadenum purpurascens RAF. Med. Rep. V, 355 (1809)

Elodes campanulata PURSH, Fl. Am. 379 (1814).

Elodes virginica NUTT. Gen. II, 17 (1818).

Wats. and Coult., Gray's Man. 6 ed. 95; Upham, Fl. Minn. 31; Britt., Fl. N. J. 68; Chap., Fl. S. St. 42; Mac., Fl. Can. I, 86; Wats., Bibl. Ind. I, 124; Webb., Appx. Neb. 32.

North America: N. S. to Winnipeg and Hudson Bay; S. to N. Eng. and Fla.; W. to Minn., Man. and Neb.

Minn. valley: Forest district and banks of streams; Ft. Snelling to Blue Earth Co.; marshes, swamps and wet woods.

HERB.: *Sheldon* 327, Smith's Mills, Blue Earth Co.; *Ballard* 817, Page lake, Carver Co.; *Ballard* 855, Page lake; *Ballard* 902, St. Bonifacius; *Bailey* 55, Vermilion lake; *Holzinger* 33, Winona Co.; *Roberts* 19, Duluth; *Sandberg* 89, Chisago Co.

LXXI. CISTACEAE. Rock-Rose Family.

Endlicher, *Gen. Pl.* 903 (1836-40); Bentham and Hooker, *Gen. Pl.* I, 112 (1862); Baillon, *Hist. Pl.* IV, 323 (1873).

Genera: 4; temperate N. hemisphere and a few in S. America; especially developed in Mediterranean region.

Species: 60 (B. and H.); 200 (described); Mediterranean region, 50; N. America, abundant.

HELIANTHEMUM PERS. Syst. II, 75 (1807).

Halimium, *Fumana*, *Tuberaria*, *Lecheoides* DUNAL, DC. Prodr. I, 266 (1824).

Rhodax, *Crocanthemum*, *Heteromeris*, *Taeniostema* SPACH, Ann. Sci. Nat. ser. 2, VI, 360 (1836).

Codomia GAUD. ex Durand, Ind. Phan. 23 (1888).

Fumanopsis POMEL. ex Durand, Ind. Phan. (1888).

Cistus LINN. Gen. 673 (1737) *in part*.

Baillon, *Hist. Pl.* IV, 331; Benth. and Hook., *Gen. Pl.* I, 113; Durand, *Ind. Gen. Phan.* 23; Gray, *Ill. Gen.* I, 203.

Living species: 27±; 100 (Dunal); 160 (described); principally Mediterranean region to the Punjaub, a few growing throughout Europe; 6 in N. America; 1-3, S. America; Russia, 8; Europe 59? (*Nym.*); Russian Europe, 3; Canada, 1; California, 1; S. Sts., 4; E. Sts., 2; Pl. Wheel., 1; W. Tex.; 3.

Helianthemum majus (LINN.) B. S. P. Cat. N. Y. (1888).

Lechea major LINN. Amoen. III, 11 (1751).

Cistus canadensis HILL. Veg. Syst. 14 (1769).

Helianthemum canadense MICHX. Fl. Am. I, 308 (1803).

H. ramuliflorum MICHX. Fl. Am. I, 307 (1803).

H. corymbosum PURSH, Fl. Am. 363 (1814).

H. rosmarinifolium PURSH, Fl. Am. 364 (1814).

Wats. and Coult., Gray's Man. 6 ed. 76; Britt., Fl. N. J. 53; Webb., Fl. Neb. 120; Chap., Fl. S. St. 36; Upham, Fl. Minn. 30; Mac., Fl. Can. I, 60, 491; Coult., Fl. Tex. 24; Wats., Bibl. Ind. I, 78.

North America: N. S., Ont. and Saskatchewan? S. to N. Eng., N. J. and Fla.; W. to Minn., Dak., Neb. and Tex.

Minn. valley: E. edge and S. E. districts; dry or sandy places and along river banks.

HERB.: *Holzinger* 32, Winona Co.; *Kassube* 40, Minneapolis; *Sandberg* 85, Goodhue Co.; *Holzinger* 33, Winona; *Sandberg* 86, Vasa.

HUDSONIA LINN. Mant. 1263 (1767).

Baillon, *Hist. Pl.* IV, 332; Benth. and Hook., *Gen. Pl.* I, 114; Durand, *Ind. Gen. Phan.* 23; Gray, *Ill. Gen.* I, 207.

Living species: 3; North America; E. Sts., 2; S. Sts., 1; Canada, 2.

Hudsonia tomentosa NUTT. Gen. II, 5 (1818).

H. ericoides RICH. Frankl. Journ. 11 (1823).

Wats. and Coult., Gray's Man. 6 ed. 77; Britt., Fl. N. J. 54; Upham, Fl. Minn. 30; Mac., Fl. Can. I, 60; Wats., Bibl. Ind. I, 79; Upham, Suppl. Minn. 50.

North America: N. S., N. Br., Q., Ont., Rainy lake to Slave lake; S. to Maine, N. J. and Md.; W. around Gt. lakes to Minn. and Dak.

Minn. valley: Local; Morton; on sandy hillsides.

HERB.: *Sandberg* 87, White Rock.

LXXII. VIOLACEAE. Violet Family.

Endlicher, *Gen. Pl.* 908 (1836-40); Lindl., *Veg. King.* 365 (1846)—*Sauvagesiaceae*; Benth. and Hook., *Gen. Pl.* I, 114 (1862); Baillon, *Hist. Pl.* IV, 333 (1873).

Genera: 18-20; cosmopolitan.

Species: 250±; cosmopolitan; herbaceous in temperate, shrubby in tropical regions.

VIOLA LINN. Gen. 679 (1737).

Mnemion SPACH, Sult. Buff. V, 510 (1836).

Chrysion SPACH, l. c. 509 (1836).

Lophion SPACH, l. c. 516 (1836).

Erpetion DC. ex Sweet, Brit. Fl. Gard. 170 (1823).

Baillon, *Hist. Pl.* IV, 351; Benth. and Hook., *Gen. Pl.* I, 117; Durand, *Ind. Gen. Phan.* 23; Gray, *Ill. Gen.* I, 185.

Living species; 250 described; 150 reduced; 100 (B. and H.); three-fourths in temperate northern hemisphere, rest in southern; almost the whole earth (Durand). Russia, 40+; Europe, 56; Russian Europe, 26; N. America, 35; Calif., 15; Canada, 27-30; E. Sts., 17-19; Rocky mts., 8-10; S. Sts., 16; Pl. King, 8-9; Pl. Wheel., 4; W. Tex., 4.

Viola sylvestris LAM. Fl. Fr. II, 680 (1778).

V. uliginosa MUHL. Cat. 25 (1813).

V. debilis PURSH, Fl. Am. 174 (1814).

V. muhlenbergiana GINGINS, DC. Prodr. I, 297 (1824).

V. muhlenbergii TORR. Fl. U. S. I, 256 (1824).

V. canina var. *syvestris* REGEL, Fl. O.-Sib. I, 245 (1862).

V. canina var. *muhlenbergii* TRAUTV. Fl. Sib. 28 (1877).

Wats. and Coult., Gray's Man. 6 ed. 81; Britt., Fl. N. J. 57; Upham, Fl. Minn. 29; Chap., Fl. S. St. 34; Brew. and Wats., Fl. Calif. 56; Mac., Fl. Can. I, 63; Led., Fl. Ross. I, 253; Herd., Fl. Russ. Eur. 22; Roth., Wheel. Exp. 68; Wats., Bibl. Ind. I, 82; Forbes and Hems., Fl. Sin. 55.

Russian Europe; Siberia to Baikals, Amur., Kamtka, China.

North America: Greenland to Alaska; S. thro. Can. to N. Eng., N. J. and Va.; W. to Minn., Dak. and Colo.

Minn. valley: N. E. and N. edge; forest region and in tamarack swamps.

HERB.: *Sheldon 1605*, Ramsey Co.

Viola striata AIT. Hort. Kew. III, 290 (1789).

V. debilis MICHX. Fl. I, 150 (1803).

V. lewisiana GING. DC. Prodr. I, 298 (1824).

V. ochroleuca SCHW. Am. Journ. Sci. I, 5, 66 (1824).

Wats. and Coult., Gray's Man. 6 ed. 80; Britt., Fl. N. J. 57; Chap., Fl. S. St. 34; Upham, Fl. Minn. 29; Mac., Fl. Can. I, 63; Wats., Bibl. Ind. I, 87.

North America: Ont. and N. Eng. to mts. of Ga.; W. to Minn. and Mo.

Minn. valley: N. edge and to the W. edge on higher levels; flat and wooded grounds.

HERB.: *Bradley 1*, Spring Park; *Herb. Wickersheim 21*, Ash lake, Lincoln Co.

***Viola canadensis* LINN.** Spec. 936 (1753).

V. albiflora LINK, Enum. Hort. Berol. I, 141 (1828).

Wats. and Coult., Gray's Man. 6 ed. 80; Britt., Fl. N. J. 57; Chap., Fl. S. St. 34; Webb., Fl. Neb. 119; Upham, Fl. Minn. 29; Coult., Fl. Colo. 29; Mac., Fl. Can. I, 64; Led., Fl. Ross. I, 254; Roth., Wheel Exp. 68; Wats., King. Exp. 35; Wats., Bibl. Ind. I, 82.

Islands in Berings st. off Siberia.

North America: Newf., N. Br., Q., Ont., Man. to Brit. Col.; S. in mts. to Wyom., Colo., Utah, Nev. and N. Mexico; E. to Alleghanies and N. Car.

Minn. valley: Forest region and wooded banks of streams; W. to Chippewa river; low and damp localities; woods.

HERB.: *Taylor 422*, Janesville; *Sheldon 290*, Madison Lake; *Sheldon 1606*, Ft. Snelling; *Sheldon 256*, Turtle lake, Le Sueur Co.; *Sandberg 82*, Red Wing; *Herb. Moyer 37*, Montevideo.

***Viola pubescens* AIT.** Hort. Kew. III, 290 (1789).

V. pennsylvanica MICHX. Fl. N. Am. II, 149 (1803).

V. uniflora var. *pubescens* REGEL, Fl. O.-Sib. I, 254 (1862).

Wats. and Coult., Gray's Man. 6 ed. 80; Chap., Fl. S. St. 34; Britt., Fl. N. J. 57; Upham, Fl. Minn. 29; Mac., Fl. Can. I, 64; Cov., Fl. Ark. 167; Wats., Bibl. Ind. I, 86.

East Siberia?

North America: N. S., N. Br., Q., Ont. to Man.; S. to N. Eng. and Va.; W. to Iowa, Minn. and Ark.

Minn. valley: Throughout; woods and shady banks; common; principally in the forest region.

HERB.: *Ballard 331*, Belle Plaine; *Bailey 236*, Vermilion lake; *Sandberg 83*, Red Wing; *Herrick 45*, Minneapolis; *Kassube 39*, Minneapolis; *Leonard 8*, Minneapolis; *Holzinger 31*, Winona Co.; *Sandberg 84*, Cannon Falls; *Hammond 10*, Lake City; *Herb. Sheldon 1834*, Minneapolis; *Herb. Wickersheim 22*, Idlewild, Lincoln Co.; *Herb. Moyer 38*, Montevideo.

***Viola rotundifolia* MICHX.** Fl. N. Am. II, 150 (1803).

Wats. and Coult., Gray's Man. 6 ed. 80; Britt., Fl. N. J. 56; Chap., Fl. S. St. 34; Upham, Fl. Minn. 28; Mac., Fl. Can. I, 61; Led., Fl. Ross. I, 248; Wats., Bibl. Ind. I, 86.

Kamtschatka?

North America: N. S. and Maine to N. Car. and Minn.

Minn. valley: Ft. Snelling and probably Leaf hills district; moist woodland and near cold springs.

HERB.: *Roberts 14*, Black Point; *Roberts 15*, Black Neck river.

***Viola lanceolata* LINN. Spec. 934 (1753).**

V. attenuata SWEET, Hort. Brit. 37 (1827).

Wats. and Coult., Gray's Man. 6 ed. 80; Britt., Fl. N. J. 56; Chap., Fl. S. St. 33; Upham, Fl. Minn. 29; Mac., Fl. Can. I, 61, 492; Coult., Fl. Tex. 25; Wats., Bibl. Ind. I, 84; Upham, Suppl. Minn. 50.

North America: N. S., N. Br., Ont. to L. Superior; S. to Fla.; W. to Minn. and Tex.

Minn. valley: Ft. Snelling; N. W. and probably along N. edge; damp woods.

***Viola primulaefolia* LINN. Spec. 934 (1753).**

V. acuta BIGEL. Fl. Bost. 100 (1824).

Wats. and Coult., Gray's Man. 6 ed. 80; Britt., Fl. N. J. 56; Chap., Fl. S. St. 33; Upham, Fl. Minn. 29; Mac., Fl. Can. I, 61; Wats., Bibl. Ind. I, 86.

North America: N. Br., Q., to N. Eng., N. J. and Fla.; W. to Minn.?

Minn. valley: Ft. Snelling and possibly in Blue Earth Co.; damp woods.

***Viola blanda* WILLD. Hort. Berol. t. 24 (1807).**

V. clandestina PURSH, Fl. Am. 173 (1814).

V. obliqua PURSH, Fl. Am. 172 (1814) *not* Hill.

Wats. and Coult., Gray's Man. 6 ed. 79; Britt., Fl. N. J. 56; Upham, Fl. Minn. 29; Chap., Fl. S. St. 33; Brew. and Wats., Fl. Calif. I, 55; Regel, Fl. O.-Sib. I, 216, 234; Led., Fl. Ross. I, 247; Mac., Fl. Can. I, 62; Cov., Fl. Ark. 167; Wats., Bibl. Ind. I, 81.

Kamtschatka.

North America: Newf. and N. S. to Man. and Brit. Col.; Ft. Franklin on Mackenzie river; S. in E. U. S. to N. Car.; W. to Minn., Mo. and Ark.

Minn. valley: Forest district and N. edge; woods and damp places; tamarack swamps.

HERB.: *Sheldon 329*, Smith's Mill, Blue Earth Co.; *Ballard 157*, Chaska; *Herrick 44*, Lake Mendoza; *Sandberg 74*, Chisago lake; *Herrick 45*, Minneapolis; *Bailey 455*, Mud Lake; *Sandberg 75*, Red Wing; *Herb. Sheld. 1718*, Minneapolis; *1838*, Lake Calhoun; *Herb. Wickersheim 19*, Mankato.

***Viola blanda* WILLD. var. *amoena* (LECONTE) B. S. P. Cat. N. Y. (1888).**

V. amoena LECONTE, Ann. Lyc. N. Y. II, 144 (1835).

V. blanda var. *palustriformis* A. GRAY, Rev. Viol. Bot. Gaz. (1886).

Wats. and Coult., Gray's Man. 6 ed. 79; Britt., Fl. N. J. 56; Wats., Bibl. Ind. I, 82; Mac., Fl. Can. II, 307.

North America: N. Y., N. J. and Ont. to Del. and W. to Lake Nepigon and Minn.

Minn. valley: Forest district; wet woods and tamarack swamps.

HERB.: *Ballard* 366, Helena, Scott Co.; *Bailey* 105, Vermilion lake; *Sheldon* 1837, Lake Calhoun.

***Viola sagittata* AIT.** Hort. Kew. III, 287 (1789).

V. sagittaeifolia SALISB. Prodr. 130 (1796).

V. ciliata MUHL. Cat. 25 (1813).

V. dentata PURSH, Fl. Am. 172 (1814).

V. ovata NUTT. Gen. I, 148 (1818).

V. alleghaniensis R. and S. Syst. V, 560 (1819).

Wats. and Coult., Gray's Man. 6 ed. 79; Britt., Fl. N. J. 56; Upham, Fl. Minn. 29; Chap., Fl. S. St. 33; Mac., Fl. Can. I, 63, 492; Cov., Fl. Ark. 167; Wats., Bibl. Ind. 87.

North America: N. S., N. Br., Q., Ont. to N. Eng. and Minn.; S. to N. J., Va. and Tenn.; W. to Mo. and Ark.

Minn. valley: Ft. Snelling to Blue Earth Co.; N. edge of valley to Leaf hill district; drier exposed hillsides.

HERB.: *Sandberg* 80, Belle Creek, Goodhue Co.; *Kasube* 37, Minneapolis; *Herrick* 46, Minneapolis; *Herb. Sheld.* 1680, Minneapolis; 1833, Minneapolis; *Sheldon* 1930, Minneapolis.

***Viola palmata* LINN.** Spec. 933 (1753).

V. heterophylla MUHL. Cat. 25 (1813).

V. cucullata var. *palmata* GRAY, Man. 5 ed. 78 (1867).

Wats. and Coult., Gray's Man. 6 ed. 79; Britt., Fl. N. J. 55; Webb., Fl. Neb. 120; Chap., Fl. S. St., 33; Upham, Fl. Minn. 29; Mac., Fl. Can. I, 63; Cov., Fl. Ark. 167; Wats., Bibl. Ind. I, 84.

North America: Ont. and E. U. S.; S. to Fla.; W. to Minn., Neb., Kan. and Ark.

Minn. valley: Throughout at lower levels; damp ground; woodland and meadow.

HERB.: *Holzinger* 27, Winona Co.; *Holzinger* 28, Winona Co.; *Sandberg* 73, Vasa; *Herb. Sheld.* 1832, Minneapolis; *Herb. Moyer* 34, Macmillan's gulch, Montevideo.

***Viola palmata* LINN. var. *obliqua* (HILL) HITCHCOCK,** Fl. Ames. 487 (1891).

V. obliqua HILL. Hort. Kew. 316 t. 12 (1768).

V. cucullata AIT. Hort. Kew. III, 228 (1789).

V. papilionacea PURSH, Fl. Am. 173 (1814).

V. asarifolia PURSH, Fl. Am. 732 (1814) *not Muhl.*

V. palmata var. *cucullata* GRAY, Rev. Viol. Bot. Gaz. (1886).

Wats. and Coult., Gray's Man. 6 ed. 79; Webb., Fl. Neb. 120; Upham, Fl. Minn. 29; Chap., Fl. S. St. 33; Britt., Fl. N. J. 55; Mac., Fl. Can. I, 62;

II, 307; Coult., Fl. Tex. 25; Wats., King Exp. 34; Roth., Wheel. Exp. 68; Cov., Fl. Ark. 167; Wats., Bibl. Ind. I, 83.

North America: Atl. to Pac. in Canada; range in U. S. like that of *V. palmata* Linn.; Texas, Rio Grande river; S. Calif.; Arizona.

Minn. valley: Throughout on lower levels; banks of streams, wooded hillsides and lake shores.

HERB.: *Taylor* 756, Glenwood; *Kassube* 36, Minneapolis; *Sandberg* 77, Vasa; *Oestlund* 16, Minneapolis; *Leonard* 7, Minneapolis; *Sandberg* 78, Red Wing; *Holzinger* 29, Winona Co.; *Herb. Sheld.* 1825, Minneapolis; 1836, Ramsey Co.; *Herb. Wickersheim* 20, Idlewild, Lincoln Co.; *Herb. Moyer* 35, Montevideo.

***Viola palmata* LINN. var. *cordata* (WALT.) B. S. P. Cat. N. Y. (1888).**

V. cordata WALT. Fl. Car. 219 (1788).

V. villosa WALT. Fl. Car. 219 (1788).

V. sororia WILLD. Enum. 263 (1809).

V. barbata MUHL. Cat. 25 (1813).

V. ciliata R. and S. Syst. V, 360 (1819).

V. cucullata var. *cordata* GRAY, Man. 5 ed. 78 (1867).

Wats. and Coult., Gray's Man. 6 ed. 79; Britt., Fl. N. J. 56; Upham, Fl. Minn. 29; Mac., Fl. Can. I, 63; Cov., Fl. Ark. 167; Wats., Bibl. Ind. I, 83; Chap., Fl. S. St. 33.

North America: Ont. and E. U. S. to Fla.; W. to Minn., Dak., Neb., Kan., Mo. and Ark.

Minn. valley: Probably throughout, but most certainly in forest region, E. and to Nicollet Co.; exposed hillsides.

HERB.: *Sandberg* 79, Red Wing.

***Viola pedatifida* G. DON, Mill. I, 320 (1831).**

V. delphinifolia NUTT. T. and G. Fl. I, 136 (1838).

Wats. and Coult., Gray's Man. 6 ed. 79; Upham, Fl. Minn. 29; Webb., Fl. Neb. 120; Coult., Fl. Colo. 29; Mac., Fl. Can. I, 493; Cov., Fl. Ark. 167; Wats., Bibl. Ind. I, 84.

North America: Ill. to Kan., Ark., Neb., Colo., Dak. and Minn.; S. in mts. to Arizona; N. to prairies of Man.

Minn. valley: Prairie region throughout; apparently less abundant than *V. pedata* Linn.; rich meadow land.

HERB.: *Kassube* 35, Minneapolis; *Sandberg* 76, Red Wing; *Herb. Moyer* 36, Montevideo.

***Viola pedata* LINN. Spec. 933 (1753).**

V. digitata PURSH, Fl. Am. 171 (1814).

V. pinnata RICH. Frankl. Journ. 6 (1823).

Wats. and Coult., Gray's Man. 6 ed. 78; Britt., Fl. N. J. 55; Chap., Fl.

S. St. 33; Upham, Fl. Minn. 29; Mac., Fl. Can. I, 63, 492; Cov., Fl. Ark. 167; Wats., Bibl. Ind. I, 85.

North America: Lat. 53° N. on Saskatchewan; N. Eng. to Minn.; S. to N. J.; Tenn., Mo. and Ark.

Minn. valley: Ft. Snelling to Brown Co. and along N. edge; rich prairies or drift-covered hillsides.

HERB.: *Sheldon* 969, Sleepy Eye; *Kassube* 38, St. Anthony Park; *Oestlund* 17, Hennepin Co.; *Sandberg* 81, Red Wing; *Holzinger* 30, Winona Co.; *Herb. Sheld.* 1836, Minneapolis.

LXXIII. CACTACEAE. Cactus Family.

Endlicher, *Gen. Pl.* 942 (1836-40), Bentham and Hooker, *Gen. Plant.* I, 845 (1868); Baillon, *Hist. Pl.* IX, 28 (1888).

Genera: 13; tropical and sub-tropical America; extending to Canada and Central Chile; 1 in Africa, Madagascar and Mauritius.

Species: 1000±; almost all confined to desert places.

OPUNTIA MILL. Dict. ed. 8 (1768).

Cactus LINN. Gen. ed. VI, 616 (1764) *in part*.

Tuna DILL. Hort. Elth. 383 (1774).

Consolea LEMAIRE, ex Durand, Ind. Gen. Phan. 153 (1888).

Baillon, *Hist. Pl.* IX, 40; Benth. and Hook. *Gen. Pl.* I, 851; Durand, *Ind. Gen. Phan.* 153.

Living species: 200 described; tropical and warmer America, 1 sp. in old world. Perhaps only 30 distinct; W. Tex., 19; E. Sts., 4; Canada, 4; Rocky mts., 6; S. Sts., 4; California, 14-17; Pl. Wheel, 13; Pl. King, 11.

Opuntia fragilis (NUTT.) HAW. Syn. Succ. Suppl. 82 (1819).

Cactus fragilis NUTT. Gen. I, 296 (1818).

Wats. and Coult., Gray's Man. 6 ed. 197; Webb., Fl. Neb. 125; Upham, Fl. Minn. 59; Coult., Fl. Colo. 112; Mac., Fl. Can. I, 532; Wats., King. Exp. 119; Wats., Bibl. Ind. I, 406.

North America: Vancouver to Brit. Col. and S. Man.; Upper Missouri and Yellowstone to N. Mex.; E. to Minn., Wisc., Iowa, Neb. and Kan.

Minn. valley: S. W. district; rocks and ledges or dry hillsides, New Ulm? to Dakota line.

HERB.: *Sheldon* 1494, Pipestone City; *Sheldon* 958, Redwood Falls.

Opuntia missouriensis DC. Prodr. III, 472 (1828).

Cactus ferox NUTT. Gen. I, 296 (1818) *not Willd.*

Opuntia polyacantha HAW. Syn. Succ. Suppl. 82 (1819).

Wats. and Coult., Gray's Man. 6 ed. 197; Mac., Fl. Can. I, 177; Webb., Fl. Neb. 125; Coult., Fl. Colo. 111; Upham, Fl. Minn. 59; Wats., King Exp. 118; Roth., Wheel. Exp. 129; Cov., Fl. Ark. 184; Wats., Bibl. Ind. I, 407.

North America: Colo. and Mont. to Neb., Minn., Kan., Ark., Mo. and Wisc.

Minn. valley: S. W. edge; ledges of quartzite or syenitic rock; rare.

HERB.: *Sheld.* 1495, Pipestone City; *Huntington* 27, Rock Co.

Opuntia rafinesquii ENGELM. Pac. R. R. Rep. IV, 41 (1856).

Cactus opuntia TORR. Fl. U. S. 466 (1824) *in part.*

Opuntia mesacantha and *caespitosa* RAF. Bull. Bot. (1830).

Wats. and Coult., Gray's Man. 6 ed. 197; Webb., Fl. Neb. 125; Upham, Fl. Minn. 59; Coult., Fl. Col. 111; Cov., Fl. Ark. 184; Coult., Fl. Tex. 135; Wats., Bibl. Ind. I, 408.

North America: Ont. to Nantucket, N. J. and Fla.; Mississippi valley; Mich., Minn. to Neb., Kan., Ky., Ark., Colo. and W. Tex.

Minn. valley: Central S. district, on ledges of rock in bed of river Warren; New Ulm to Dakota line.

HERB.: *Sheldon* 1204, Redstone, near New Ulm.

LXXIV. THYMELAEACEAE. *Mezereum* Family.

Lindl. *Veg. King* 530 (1846); Baillon, *Hist. Pl.* VI, 100 (1877); Endlicher, *Gen. Pl.* 329, 332 (1836-40)—*Daphnoideae* and *Aquilarineae*; Bentham and Hooker, *Gen. Plant.* III, 186 (1880).

Genera: 37±; temperate regions, especially abundant in Australia, S. Africa and Mediterranean region.

Species: 375±, living; 30-40 fossil in Tertiary rocks.

DIRCA LINN. Diss. Chenon. (1751), Gen. V, 437 (1754).

Dofia ADANS. Fam. II, 285 (1763).

Baillon, *Hist. Pl.* VI, 130; Benth. and Hook. *Gen. Pl.* III, 191; Durand, *Ind. Gen. Phan.* 354.

Living species: 1-2; E. U. S. and California.

Dirca palustris LINN. Amoen. III, 12 (1756).

Wats. and Coult., Gray's Man. 6 ed. 448; Britt., Fl. N. J. 213; Mac., Fl. Can. I, 420; Chap., Fl. S. St. 395; Upham, Fl. Minn. 121; Cov., Fl. Ark. 217.

North America: N. Br., Q., Ont. to Owen Sound; S. to Fla.; W. to Minn., Mo., Neb.? and Ark.

Minn. valley: Forest district and N. edge; banks of streams and low thickets.

HERB.: *Sheldon 1611*, Ramsey Co.; *Sandberg 485*, Vasa; *Herb. Sheld. 1903*, Ramsey Co.; *Herb. Wickersheim 113*, Mankato.

LXXV. ELAEAGNACEAE. Oleaster Family.

Endlicher, *Gen. Pl.* 333 (1836-40); Bentham and Hooker, *Gen. Plant.* III, 203 (1880); Baillon, *Hist. Pl.* II, 487 (1870).

Genera: 3; temperate N. hemisphere and S. in Asia, Phillipines and to Australia.

Species: 16; 12 in *Elaeagnus* (B. and H.); ?10± fossil from Tertiary rocks.

LEPTARGYRAIA RAF. *Am. Mo. Mag.* II, 176 (Jan. 1818).

Shepherdia NUTT. *Gen.* II, 240 (later, 1818).

Benth and Hook., *Gen. Pl.* III, 204; Durand, *Ind. Gen. Phan.* 356; Schenck, *Palaeophyt.* 649; O. Kuntze, *Rev. Gen.* II, 585.

Living species: 3; N. America; 1, mts. of S. Utah; 1, Canada and Brit. Col.; 1, E. Sts.

Leptargyria argentea (NUTT.) GREENE, *Pittonia* II, 122 (1890).

Elaeagnus argentea NUTT. *Fras. Cat.* (1813).

Hippophae argentea PURSH, *Fl. Am.* I, 113 (1814).

Shepherdia argentea NUTT. *Gen.* II, 240 (1818).

Wats. and Coult., *Gray's Man.* 6 ed. 449; Webb., *Fl. Neb.* 127; Wats., *Fl. Calif.* II, 62; Coult., *Fl. Colo.* 322; Upham, *Fl. Minn.* 121; Mac., *Fl. Can.* I, 422; Wats., *King Exp.* 318.

North America: Saskatchewan and Assiniboia to Minn., Neb., Kan., N. Mex. and W. to Sierra Nevada mts.

Minn. valley: In small numbers along the extreme W. edge, in Dakota; extending into Minn. near Brown's valley; high sheltered slough edges and thickets.

ELAEAGNUS LINN. *Gen.* 84 (1737).

Octarillum LOUR. *Cochinch.* 90 (1790).

Benth. and Hook. *Gen. Pl.* III, 204; Durand, *Ind. Gen. Phan.* 356; Schenck, *Palaeophyt.* 649.

Living species: 27-30 described; 12 reduced; S. Europe; temperate and tropical Asia, Australia and N. America. Europe, 1; Russia, 1; N. America, 1.

Fossil species: *Elaeagnaceae* described from Tertiary of Bonn, Spitzbergen and Greenland (*Heer*).

Elaeagnus argentea PURSH, *Fl. Am.* 114 (1814).

E. commutata BERNH. *Thur. Allge. Gartenz.* II, 95 (1819?).

Wats. and Coult., *Gray's Man.* 6 ed. 449; Mac., *Fl. Can.* I, 420; Upham,

Fl. Minn. 121; Coult., Fl. Colo. 321; Wats., King Exp. 318; Roth., Wheel Exp. 238.

North America: Isle of Orleans, Man., L. Nipigon and Assiniboia to Rocky mts.; N. to L. Athabasca and 56° N. lat. to 69° N. lat. in Rockies; Hudson Bay and Arctic circle; S. to Mon., Colo., Utah and E. to Minn. and Dak.

Minn. valley: Local on the upper Pomme des Terres river; thickets, riverbanks and edges of sloughs.

LXXVI. LYTHRACEAE. Loosestrife Family.

Endlicher, *Gen. Pl.* 1198 (1836-40); Bentham and Hooker, *Gen. Plant.* I, 773 (1862-1867); Baillon, *Hist. Pl.* VI, 426 (1877); Koehne, in *Engler and Prantl, Nat. Pflanz.* 3, VII, 8 (1892).

Genera: 22; tropical regions, sparingly extended into the N. and S. temperate zones; principally in W. hemisphere.

Species: 360; 1-2 doubtful fossils from Pliocene.

LYTHRUM LINN. Gen. 387 (1737).

Salicaria TOURN. Inst. 253 (1700).

Anisotes LINDL. Intr. Nat. Syst. ed. II, 101 (1835).

Pentaglossum FORSK. Fl. Aeg. Arab. 11 (1775).

Mozula RAF. Jour. Phys. LXXXIX, 96 (1819).

Pythagorea RAF. Jour. Phys. LXXXIX, 96 (1819).

Bergenia NECK. Elem. (1790).

Middendorfia TRAUTV. ex Durand, Ind. Gen. Phan. 139 (1888).

Baillon, *Hist. Pl.* VI, 446; Benth. and Hook., *Gen. Pl.* I, 779; Durand, *Ind. Gen. Phan.* 139; Engler and Prantl, *Nat. Pflanz.* 3, VII, 8 (Koehne).

Living species: 23: cosmopolitan. Europe, 10; Asia, 10; Russia, 9; Russian Europe, 7; North America, 4 or 5: W. Tex., 3; California, 4; Rocky mts., 1; Canada, 2; S. Sts., 2; E. Sts., 3; Pl. Wheel., 1; Africa, 8; all America, 12; Australia, 2.

Lythrum alatum PURSH, Fl. Am. 334 (1814).

Pythagorea alata RAF. Journ. Phys. 96 (1819).

Lythrum kennedyanum HBK. Nov. Gen. et. Spec. VI, 194 (1823).

Wats. and Coult., Gray's Man. 6 ed. 185; Britt., Fl. N. J. 107; Mac., Fl. Can. I, 175, 532; Webb., Fl. Neb., 127; Chap., Fl. S. St., 134; Brew. and Wats., Fl. Calif. I, 214; Coult., Fl. Colo. 100; Upham, Fl. Minn. 58; Coult., Fl. Tex. 112; Roth., Wheel. Exp. 120; Cov., Fl. Ark. 183; Wats., Bibl. Ind. I, 361.

North America: Ont. to N. Eng., N. J., Ga. and Fla.; W. to Minn., Neb., Colo., Ark. and S. W. Tex.

Minn. valley: Throughout; local or infrequent; damp meadows or bases of hills.

HERB.: *Sheldon* 790, Sleepy Eye; *Taylor* 572, Minnesota lake; *Kassube* 97, Minneapolis; *Herrick* 119, Minneapolis; *Sandberg* 211, Cannon Falls; *Herb. Moyer* 88, Montevideo.

LXXVII. OENOTHERACEAE. Evening-Primrose Family.

Endlicher, *Gen. Pl.* 1118 (1836-40); Lindl., *Veg. King.* 724 (1846)—*Onagraceae*; Bentham and Hooker, *Gen. Plant*, I, 785 (1862-1867); Baillon, *Hist. Pl.* VI, 458 (1877)—excl. *Halorrhagidaceae*.

Genera: 16-20; temperate regions; rarer in the tropics.

Species: 300-350; a few fossil in Tertiary.

ISNARDIA LINN. Gen. 842 (1737).

Ludwigia LINN. Corr. 943 (1737).

Prieuria DC. Prodr. III, 58 (1828).

Nematopyxis MIQ. Fl. Ind. Bat. I, 630 (1859).

Dantia THOU. Gen. Nov. Mad. 49 (1806?).

Jussiaea LINN. Gen. 538 (1737).

Cubospermum LOUR. Fl. Coch. 275 (1790).

Vigiera VELLOZ. Fl. Flum. II, 73, 74 (1827).

Corynostigma PERSL. Epim. 218 (1844).

Baillon, *Hist. Pl.* VI, 491; Benth. and Hook., *Gen. Pl.* I, 788; Durand, *Ind. Gen. Phan.* 140; O. Kuntze, *Rev. Gen.* I, 250.

Living species: 60±; Europe, Asia, Africa, N. America, and most tropical regions. North America, 24; S. Sts., 20; E. Sts., 10; Canada, 2-3; California, 2.

Isnardia palustris LINN. Spec. 120 (1753).

Ludwigia apetala WALT. Fl. Car. 89 (1788).

L. nitida MICHX. Fl. N. Am. I, 87 (1803).

L. palustris ELL. Sk. I, 211 (1821).

Isnardia palustris var. *americana* DC. Prodr. III, 61 (1828).

Wats. and Coult., Gray's Man. 6 ed. 188; Britt., Fl. N. J. 109; Mac., Fl. Can. I, 168; Chap., Fl. S. St. 142; Hook., Fl. Gt. Brit. 158; Upham, Fl. Minn. 58; Webb., Fl. Neb. 126; Brew. and Wats., Fl. Calif. I, 217; Coult., Fl. Tex. 113; Cov., Fl. Ark. 183; Wats., Bibl. Ind. I, 375; Greene, Fl. Fran. 227.

Europe; S. Africa; W. Asia.

North America: N. S., N. Br., Q., Ont. to Saskatchewan; S. to N. Eng., N. J. and Fla.; W. to Minn., Neb., Ark. and W. Tex.; also, Sierra Co., Calif., and Oregon.

Minn. valley: Forest district to Blue Earth Co.; rare; swamps and low meadows.

Isnardia polycarpa (SHORT and PETER) OK. Rev. Gen. I, 251 (1891).

Ludwigia polycarpa S. and P. Suppl. Pl. Ky. II, 7 (1833).

Wats. and Coult., Gray's Man. 6 ed. 188; Webb., Fl. Neb. 126; Upham, Fl. Minn. 58; Cov., Fl. Ark. 183; Wats., Bibl. Ind. I, 376.

North America: Mass. and Conn. to Mich., Minn., Neb., Kan., Ark. and Ky.

Minn. valley: Reported from N. E. district; low meadows and swamps.

HERB.: *Manning* 4, Lake City.

GAURA LINN. Diss. Chen. 1111 (1751); Gen. ed. V, 425 (1754).

Schizocarya SPACH, Ann. Mus. IV, 325 (1835).

Gauridium SPACH, Suit. Buff. IV, 379 (1839).

Stenosiphon SPACH, Ann. Mus. IV, 326 (1835).

? **Heterogaura** ROTH. Proc. Am. Acad. VI. 354 (1864).

? **Gongylocarpus** CHAM. and SCHLECHT. Linn. V, 557 (1831).

Baillon, *Hist. Pl.* VI, 493; Benth. and Hook., *Gen. Pl.* I, 793; Durand, *Ind. Gen. Phan.* 141.

Living species: 20-25; warmer N. America and Mexico. W. Tex., 9-10; Canada, 2; Rocky mts., 4; E. Sts., 4; California, 2-3; S. Sts., 3; Pl. Wheel., 6-7; Pl. King, 2.

Gaura coccinea NUTT, Fras. Cat. (1813).

G. marginata LEHM. Hook. Fl. Bor.-Am. I, 208 (1833).

G. glabra LEHM. Hook. Fl. Bor.-Am. I, 208 (1833).

Schizocarpa (?) *crispa* SPACH, Monog. Onag. 58 (1838).

Wats. and Coult., Gray's Man. 6 ed. 193; Mac., Fl. Can. I, 174; Coult., Fl. Colo. 106; Webb., Fl. Neb. 126; Roth, Wheel. Exp. 40; Upham, Fl. Minn. 57, Suppl. 51; Cov., Fl. Ark. 183.

North America: Red and Saskatchewan valleys to Rocky mts., S. to Mont. and Colo.; E. to Minn., Neb., Kan. and Ark.

Minn. valley: W. district from Chippewa valley; high plains and knolls.

HERB.: *Wickersheim* 3, Idlewild, Lincoln Co.; *Sheldon* 1384, Lake Benton; *Herb. Moyer* 87, Montevideo.

Gaura biennis LINN. Spec. 347 (1753).

Pleurandra alba RAF. Fl. Lud. 95 (1817).

Pleurostemon album RAF. Adn. (1820).

Wats. and Coult., Gray's Man. 6 ed. 192; Chap., Fl. S. St. 138; Britt., N. J. 110; Upham, Fl. Minn. 57; Webb., Fl. Neb. 126; Coult., Fl. Colo. 106; Wats., Bibl. Ind. I, 368; Mac., Fl. Can. I, 174, 521.

North America: Ont., N. Y., and N. J. to Ga. and Tenn.; W. to Minn., Dak., Idaho and Neb.; S. to Mo. and Ark.

Minn. valley: Reported from S. E. district, but possibly not in the valley; banks and hillsides.

EPILOBIUM LINN. Gen. 319 (1737).

Chamoenerium TAUSCH, Hort. Canal. I (1823).

Lysimachion TAUSCH, l. c. (1823).

Crossostigma SPACH, Ann. Mus. IV, 328 (1835).

Baillon, *Hist. Pl.* VI, 492; Benth. and Hook. *Gen. Pl.* I, 787; Durand, *Ind. Gen. Phan.* 140.

Living species: 60; all temperate and colder regions; New Zealand. Russia, 20; Europe, 18; Russian Europe, 17; North America, 38; Canada, 26; Pac. region, 34; E. Sts., 10; Central Calif., 17.

Epilobium hornemanni RCHB. Icon. Crit. II, 73 (1824).

E. origanifolium LAM. Enc. Meth. II, 376 (1786).

E. anagallidifolium AUCT. AMER. in part.

E. alpinum GRAY, Man. 5 ed. (1869).

Wats. and Coult., Gray's Man. 6 ed. 189; Upham, Fl. Minn. 57; Mac., Fl. Can. I, 169, 530?; Hook., Fl. Gt. Brit. 158; Coult., Fl. Colo. 102; Brew. and Wats., Fl. Calif. I, 219; Led., Fl. Ross. II, 111, 112; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 50; Trelease, Monog. Epilob. 105; Roth., Wheel. Exp. 361; Wats., King. Exp. 103? in part?; Wats., Bibl. Ind. I, 365; Hart., Fl. Scand. I, 263; Webb., Appx. Neb. 34; Greene, Fl. Fran. 208.

Russian Europe to N. W. Asia; Arctic Europe.

North America: Greenland, Labrador, Q. to Rocky mts., Selkirks, Alaska and Cape Chudleigh.—to lat. 56° N.; S. to White mts.; S. to Minn. and Wisc.; S. in Rockies to Mont., Colo. and Utah; S. in Pac. reg. to Oregon, Calif. and Idaho.

Minn. valley: Forest district, Ft. Snelling to Blue Earth Co.; rare; woods and along streams.

HERB.: *Leiberg* 19, Minneopa Falls, Blue Earth Co.

Epilobium coloratum MUHL. Willd. Enum. I, 411 (1809)

E. divaricatum RAF. Prec. Decouv. 41 (1814).

E. tetragonum PURSH, Fl. Am. 259 (1814).

Wats. and Coult., Gray's Man. 6 ed. 189; Coult., Fl. Colo. 102; Mac., Fl. Can. I, 170, 530; Upham, Fl. Minn. 57; Webb., Fl. Neb. 126; Chap., Fl. S. St., 140; Brew. and Wats., Fl. Calif. I, 219; Britt., Fl. N. J. 109; Trelease, Monog. Epilob. 93; Wats., King. Exp. 103; Roth., Wheel. Exp. 120, 361; Cov., Fl. Ark. 183; Wats., Bibl. Ind. I, 364.

North America: Newf., N. S., N. B., Q., Ont. to Saskatchewan, N. W. T. and Rocky mts.; S. to N. Eng., N. J., S. Car.; W. to Minn., Neb., Kan., Ark. and Dak.

Minn. valley: Throughout; high wet places and along streams.

HERB.: *Taylor* 411, Buffalo lake, Waseca Co.; *Ballard* 119, Chaska; *Taylor* 847, Glenwood; *Ballard* 476, Prior's lake, Scott Co.; *Taylor* 953, Glenwood; *Sheldon* 877, Sleepy Eye; *Taylor* 1079, Glenwood; *Taylor* 698, Minnesota lake; *Ballard* 752, Waconia; *Kassube* 94, Minneapolis; *Herrick* 114, Minneapolis; *Bailey* 157, Vermilion lake; *Holzinger* 81, Stockton; *Bailey* 461, Agate bay; *Holzinger* 82, Winona Co.; *Herrick* 115, Minneapolis; *Oestlund* 61, Minneapolis; *Bailey* 576, Agate bay; *Sandberg* 207, Goodhue Co.

Epilobium strictum MUHL. Cat. 39 (1813).*E. molle* TORR. Fl. U. S. 393 (1824).

Wats. and Coult., Gray's Man. 6 ed. 189; Upham, Fl. Minn. 57; Mac., Fl. Can. I, 171; Britt., Fl. N. J. 109; Trelease Monog. Epilob. 87; Wats., Bibl. Ind. I, 365.

North America: N. S., Q., Ont. to L. Athabasca; S. to Maine, N. Y., N. J., Penn. and Va.; W. to Ohio, Ills., Mich., Wisc. and Minn.

Minn. valley: Forest district; Ft. Snelling to Blue Earth Co.; infrequent; bogs and edges of marshes.

HERB.: *Ballard* 798, Goose lake, Carver Co.; *Ballard* 843, Patterson lake, Carver Co.; *Ballard* 895, St. Bonifacius; *Ballard* 724, Benton, Carver Co.; *Leiberg* 21, Blue Earth Co.

Epilobium palustre LINN. Spec. 348 (1753).*E. anagallidifolium* AUCT. AMER. in part.*E. oliganthum* MICHX. Fl. N. Am. I, 223 (1803) in part.*E. palustre* var. *lineare* GRAY, Man. 2 ed. 130 (1852) in part.? *E. palustre* var. *oliganthum* B. S. P. Cat. N. Y. (1888) in part.

Wats. and Coult., Gray's Man. 6 ed. 190; Upham, Fl. Minn. 57; Britt., Fl. N. J. 108?; Trautv., Fl. Sib. in var. 55; Coult., Fl. Colo. 102; Mac., Fl. Can. I, 170; Hook., Fl. Gt. Brit. 157; Chap., Fl. S. St. 140?; Forbes and Hems., Fl. Sin. 308; Led., Fl. Ross. II, 109; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 50; Wats., Bibl. Ind. I, 366; Trelease, Monog. Epilob. 88; Hart., Fl. Scand. I, 264.

Europe and Asia to Himalayas and India.

North America: Greenland and Labrador to N. H., N. J. ? and Penn. ? W. to Minn., Colo., Alaska, N. W. T. and Washington.

Minn. valley: N. W. and W. districts; probably also N. and N. E.; bogs and marshes.

HERB.: *Taylor* 830, Glenwood; *Sheldon* 1329, Lake Benton.

Epilobium lineare MUHL. Cat. 39 (1813).*E. densum* RAF. Desv. Journ. II, 271 (1814).*E. rosmarinifolium* PURSH, Fl. Am. 259 (1814).*E. squamatum* NUTT. Gen. I, 250 (1818).*E. palustre* var. *lineare* GRAY, Man. 2 ed. 130 (1852).*E. oliganthum* MICHX. Fl. N. Am. I, 223 (1803) in part.? *E. palustre* var. *oliganthum* (MICHX.) B. S. P. Cat. N. Y. (1888).

Wats. and Coult., Gray's Man. 6 ed. 189; Britt., Fl. N. J. 108; Upham, Fl. Minn. 57; Mac., Fl. Can. I, 170; Chap., Fl. S. St. 140?; Coult., Fl. Colo. 102; Webb., Fl. Neb. 126; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 50; Roth., Wheel. Exp. 39; Trelease, Monog. Epilob. 87, 88; Wats., Bibl. Ind. I, 366; Hart., Fl. Scand. I, 265.

Norway, Scand., Lapland and N. Russia.

North America: Labrador and N. Br. to Man., Brit. Col. and Selkirks to lat. 68° N. on Mackenzie river; S. to N.

Eng., N. J., Del., Penn., Ills., Kan., Neb., Ind. Terr. and Yellowstone reg.

Minn. valley: N. E., N. and N. W. districts; bogs and marshes.

HERB.: *Taylor* 954, Glenwood; *Ballard* 842, Patterson lake, Carver Co.; *Roberts* 40, Stewart river; *Herrick* 113, Minneapolis; *Sandberg* 206, Red Wing; *Bailey* 70, Vermilion lake; *Bailey* 320, St. Louis river; *Leiberg* 20, Blue Earth Co.; *Herb. Sheld.* 1664, Minneapolis.

***Epilobium angustifolium* LINN. emend. Spec. 347 (1753).**

E. spicatum LAM. Fl. Fr. 1077 (1778).

E. pauciflorum SCHRANK, Pl. Labr. (1820).

Chamoenerium angustifolium SPACH, Hist. Veg. IV, 396 (1835).

Wats. and Coult., Gray's Man. 6 ed. 188; Mac., Fl. Can. I, 168, 530; Upham, Fl. Minn. 57; Britt., Fl. N. J. 108; Webb., Fl. Neb. 126; Hook., Fl. Gt. Brit. 156; Trautv., Fl. Sib. 54; Chap., Fl. S. St. 139; Coult., Fl. Colo. 101; Brew. and Wats., Fl. Calif. I, 218; Forbes and Hems., Fl. Sin. 307; Led., Fl. Ross. II, 105; Miyabe, Fl. Kur. 235; Herd., Fl. Eur. Russ. 50; Trelease, Monog. Epilob. 80; Roth., Wheel. Exp. 120; Wats., King Exp. 104; Wats., Bibl. Ind. I, 366; Hart., Fl. Scand. I, 262; Greene, Fl. Fran. 210.

Temperate and Arctic Europe to Caucasus; N. and W. Asia, all Siberia to Himalayas; China, Japan and Kuriles.

North America: Greenland, Newf., Labrador, N. S., N. Br. to Hudson Bay, N. W. T. and Alaska; S. to N. Eng., N. J. and mts. of N. Car.; S. to Minn., Neb., Colo., Kan. and Baker mts., Arizona; S., W. of Rockies to Oregon, Calif. and Nevada; N. Mexico, Arizona and S. Utah.

Minn. valley: Forest district and N. W. district; rare E. in valley; infrequent N. W.; burnt woodland or barrens.

HERB.: *Taylor* 1036, Glenwood; *Ballard* 343, Helena, Scott Co.; *Holzinger* 80, Winona Co.; *Leonard* 18, Duluth; *Winchell* 6, Duluth; *Herrick* 112, Minneapolis; *Kassube* 93, Minneapolis; *Bailey* 9, Vermilion lake; *Arthur* 153, Vermilion lake — (white-flowered form); *Sandberg* 205, Red Wing; *MacM. and Sheld.* 30, Brainerd.

CIRCAEA LINN. Gen. 9 (1737).

Ocimastrum RUPP. Fl. Ingr. 366 (1718).

Baillon, *Hist. Pl.* VI, 141; Benth. and Hook., *Gen. Pl.* I, 793; Durand, *Ind. Gen. Phan.* 141; Schenck, (Onagraceae), *Palaeophyt.* 630.

Living species: 6; N. hemisphere, boreal and temperate regions. Russia, 3; Europe, 3; North America, 3; Canada, 3; S. Sts., 2; E. Sts., 2; California, 1; Rocky mts., 1; Pl. King, 1.

Fossil species: *Trapa natans* is found in Tertiary of Alaska, Colo., Portugal, Japan and Saghalin, and in Quaternary at Cromer.

***Circaea alpina* LINN. Spec. 9 (1753).**

Wats. and Coult., Gray's Man. 6 ed. 193; Britt., Fl. N. J. 111; Mac., Fl. Can. I, 174; Hook., Fl. Gt. Brit. 159; Upham, Fl. Minn. 57; Chap., Fl. S. St. 143; Forbes and Hems., Fl. Sin. 310; Led., Fl. Ross. II, 114; Nym., Fl. Eur.; Miyabe, Fl. Kur. 235; Herd., Fl. Eur. Russ. 50; Wats., King Exp. 113; Wats., Bibl. Ind. I, 363; Hart., Fl. Scand. I, 266.

Europe; N. and W. Asia to Himalayas, India, China and Kurile Isls.; N. Africa.

North America: Labrador to N. Eng., N. J. and Ga.; W. to Ind. and Minn.; N. to Man., N. W. T. and Alaska.

Minn. valley: Forest district to Blue Earth Co.; deep woods and near springs or bogs.

HERB.: *Sheldon* 269, Madison Lake; *Roberts* 39, Duluth; *Herrick* 111, Minneapolis; *Holway* 28, Vermilion lake; *Sandberg* 204, Chisago Co.; *Bailey* 207, Vermilion lake.

***Circaea lutetiana* LINN. Spec. 8 (1753).**

C. lutetiana var. *canadensis* LINN. Spec. 8 (1753).

C. canadensis HILL. Veg. Syst. 10 (1762).

Wats. and Coult., Gray's Man. 6 ed. 193; Britt., Fl. N. J. 111; Webb., Fl. Neb. 125; Mac., Fl. Can. I, 175; Chap., Fl. S. St. 143; Hook., Fl. Gt. Brit. 159; Upham, Fl. Minn. 57; Forbes and Hems., Fl. Sin. 310; Led., Fl. Ross. II, 113; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 50; Cov., Fl. Ark. 184; Wats., Bibl. Ind. I, 363; Hart., Fl. Scand. I, 265.

Europe; N. Africa; N. and W. Asia to Caucasus, Ural and Altai Siberia and Himalayas to China.

North America: N. S., N. Br., Q., Ont. to N. Eng., N. J. and Ga.; W. to Minn., Neb., Wyoming and Ark.

Minn. valley: Throughout, especially in forest district; damp woods and along streams or near lake shores.

HERB.: *Sheldon* 1038, Sleepy Eye; *Sheldon* 805, Sigel township, Brown Co.; *Sheldon* 940, Redwood Falls; *Taylor* 886, Glenwood; *Ballard* 493, Prior's lake, Scott Co.; *Ballard* 537, Cleary's lake, Scott Co.; *Ballard* 672, Waconia; *Ballard* 857, Page lake, Carver Co.; *Sandberg* 203, White Rock; *Oestlund* 58, Minneapolis; *Holzinger* 79, Winona Co.; *Oestlund* 60, Minneapolis; *Herrick* 110, Minneapolis; *Winchell* 5, Minnetonka.

GENOTHERA LINN. Gen. 318 (1737).

Onagra, Baumannia, Xylopleurum, Kneiffia, Lavauxia, Pachylophus, Megapterium, Calylophus, Godetia, Boisduvalia, Agassizia, Hartmannia SPACH, Suit. Buff. IV, 357 seq. (1839).

Meriolix RAF. Am. Mo. Mag. (1819).

Sphaerostigma ENDL. Gen. 1189 (1840).

Chamissonia LINK, Jahrb. 186 (1818).

Holostigma. Cratericarpum, Blennoderma SPACH, Ann. Mus. IV, 327 seq. (1835).

Primulopsis TORR. and GR. Fl. Am. I, 506 (1838).

Heterostemum NUTT. ex Endl. Gen. 6113 (1840).

Taraxia NUTT. T. and G. Fl. Am. I, 506 (1838).

Chylisma SPACH, ex Durand, Ind. Gen. Phan. 141 (1888).

Baillon, *Hist. Pl.* VI, 490; Benth. and Hook., *Gen. Pl.* I, 789; Durand, *Ind. Gen. Phan.* 141.

Living species: 100±; tropical and temperate America; Tasmania, and a few around the world in warmer regions. North America, 80; California, 40-45; Canada, 10; Rocky mts., 19-21; E. Sts., 16-17; Pl. Wheel., 20-25; Pl. King, 20; S. Sts., 8; W. Tex., 24; 1 intro. in Russia, 1 in Europe.

Oenothera albicaulis NUTT. Fras. Cat. (1813).

O. pallida LINDL. Bot. Reg. 1142 (1832).

Baumannia nuttalliana and *douglasiana* SPACH, Hist. Veg. IV, 352 (1838).

Oenothera pinnatifida var. *integrifolia* GRAY, Pl. Fendl. 44 (1849).

Wats. and Coult., Gray's Man. 6 ed. 191; Webb., Fl. Neb. 126; Upham, Fl. Minn. 58; Coult., Fl. Colo. 104; Mac., Fl. Can. 172; Brew. and Wats., Fl. Calif. I, 223; Roth., Wheel. Exp. 122; Wats., King Exp. 106; Wats., Bibl. Ind. I, 377; Webb., Appx. Neb. 33; Greene, Fl. Fran. 212.

North America: Brit. Col. and Saskatchewan to W. Minn., Neb., Kan., N. Mex.; W. to Mont., Wyoming, Colo., and Sierra Nevada mts.

Minn. valley: W. districts, from New Ulm; prairies and high hills.

HERB.: *Sheldon* 1194, New Ulm.

Oenothera serrulata NUTT. Gen. I, 246 (1818).

Calylophus nuttallii SPACH, Monog. Onag. 17 (1838).

Meriolix serrulata WALP. Rep. II, 79 (1843).

Oenothera fruticosa GRAY, Pl. Fendl. 44 (1849).

Wats. and Coult., Gray's Man. 6 ed. 192; Webb., Fl. Neb. 126; Upham, Fl. Minn. 58; Coult., Fl. Colo. 105; Coult., Fl. Tex. 117; Cov., Fl. Ark. 183; Wats., Bibl. Ind. I, 385.

North America: Wisc. and Minn. to Dak., Neb., Mo., Ark., N. Mex. and Tex.

Minn. valley: Throughout; especially at higher levels in prairie district; high fields, hillsides.

HERB.: *MacMillan* 12, Glenwood; *Sheldon* 932, Redwood Falls; *Sheldon* 731, Sigel township, Brown Co.; *Sheldon* 1576, Lake Benton; *Sheldon* 1109, Springfield; *Taylor* 750, Glenwood; *Ballard* 179, Jordan, Scott Co.; *Holzinger* 84, Winona Co.; *Oestlund* 63, Minneapolis; *Herrick* 118, Minneap-

olis; *Juni* 3, Wilmar; *Sandberg* 210, Red Wing; *Kassube* 96, Minneapolis; *Herb. Sheld.* 1782, Minneapolis; *Herb. Wickersheim* 51, Idlewild; *Herb. Moyer* 86, Minnesota valley, near Montevideo.

***Oenothera pumila* LINN.** Spec. 2 ed. 493 (1762).

Oe. pusilla MICHX. Fl. N. Am. I, 225 (1803).

Oe. chrysantha MICHX. Fl. N. Am. I, 225 (1803).

Kneiffia pusilla and *chrysantha* SPACH, Monog. Onag. 47, 48 (1838).

Wats. and Coult., Gray's Man. 6 ed. 191; Britt., Fl. N. J. 110; Mac., Fl. Can. I, 172; Chap., Fl. S. St. 139; Upham, Fl. Minn. 58; Wats., Bibl. Ind. I, 384.

North America: N. S., N. Br., Q., Ont. to S. Man.; S. to N. Eng., N. J., and W. to Minn. and Kan.

Minn. valley: Reported from N. edge and S. E. district; infrequent or local.

***Oenothera rhombipetala* NUTT.** T. and G. Fl. I, 493 (1838).

Wats. and Coult., Gray's Man. 6 ed. 190; Webb., Fl. Neb. 126; Coult., Fl. Colo. 103; Upham, Fl. Minn. 58; Cov., Fl. Ark. 183; Wats., Bibl. Ind. I, 384.

North America: Ind. to Minn., Dak., Neb., Ind. Terr. and Ark.

Minn. valley: N. E. district and probably to Blue Earth Co.; sandy or barren soil.

HERB.: *Kassube* 95, Minneapolis; *Sandberg* 209, Cannon Falls.

***Oenothera biennis* LINN.** Spec. 346 (1753).

Oe. parviflora LINN. Spec. 2 ed. 492 (1762).

Onagra biennis SCOP. Fl. Carn. 2 ed. 451 (1772).

Oenothera gauroides HORNEM. Hort. Hafn. 362 (1807).

? *Onoseris acuminata* RAF. Fl. Lud. 96 (1817).

Wats. and Coult., Gray's Man. 6 ed. 190; Britt., Fl. N. J. 109; Mac., Fl. Can. I, 171; Webb., Fl. Neb. 126; Upham, Fl. Minn. 57; Chap., Fl. S. St. 138; Hook., Fl. Gt. Brit. 159; Brew. and Wats., Fl. Calif. I, 223; Coult. Fl. Colo. 103; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 50; Coult., Fl. Tex. 114; Roth., Wheel. Exp. 121; Wats., King Exp. 106; Cov. Fl. Ark. 183; Wats., Bibl. Ind. I, 377.

Naturalised in S. Africa, India, Australia and W. Europe.

North America: Atl. to Pac. in Canada; N. to Labrador and N. W. T.; throughout U. S.

Minn. valley: Throughout; fields, along roads and on railway embankments; common.

HERB.: *Sheldon* 980, Sleepy Eye; *Sheldon* 511, Waseca; *Taylor* 726, Minnesota lake; *Ballard* 249, Jordan, Scott Co.; *Ballard* 563, Prior's lake, Scott Co.; *Ballard* 646, Chaska; *Shel-*

don 1306, Lake Benton; *Ballard* 763, Waconia; *Taylor* 864, Glenwood; *Ballard* 889, St. Bonifacius; *Sandberg* 208, Cannon Falls; *Bailey* 502, Agate bay; *Herrick* 116, Minneapolis; *Roberts* 41, Grand Marais; *Herrick* 117, Minneapolis; *Holzinger* 83, Winona Co.; *Oestlund* 62, Minneapolis; *Herb. Sheld.* 1921, Minneapolis; *Herb. Moyer* 85, Montevideo.

LXXVIII. HALORRHAGIDACEAE. Water-Milfoil Family.

Endlicher, *Gen. Pl.* 1195 (1836-40); Endlicher, *Gen. Pl.* 285 (1836-40)—*Gunneraceae*; Bentham and Hooker *Gen. Plant.* I, 673 (1865); Baillon, *Hist. Pl.* VI, 485 (1877)—sub *Onagrariaceae*, Trib. V, VI, VII.

Genera: 6-7; cosmopolitan.

Species: 100± living; almost all aquatic; a few fossil in Tertiary rocks.

HIPPURIS LINN. Gen. 1 (1737).

Limnopeuce VAILL. Act. Acad. Par. 1 (1719).

Pinastella DILL. Nov. Gen. 168 (1719).

Baillon, *Hist. Pl.* IV, 499; Benth. and Hook., *Gen. Pl.* I, 675; Durand, *Ind. Gen. Phan.* 122; Schenck, *Palaeophyt.* 632.

Living species: 3±; Europe; Asia; North America; Chile to Patagonia. North America, 3; Europe, 1; Russia, 2; Canada, 3; California, 1; Pl. King, 1; Rocky mts., 1; Pl. Wheel., 1.

Fossil species: *H. vulgaris* in Cromer forest bed.

Hippuris vulgaris LINN. Spec. 4 (1753).

Limnopeuce vulgaris VAILL. Mem. Par. 15 (1719).

Hippuris polyphylla RAF. Fl. Lud. 13 (1817).

Wats. and Coult., Gray's Man. 6 ed. 182; Mac., Fl. Can. I, 167, 529; Coult., Fl. Colo. 99; Brew. and Wats., Fl. Calif. I, 215; Hook., Fl. Gt. Brit. 151; Forbes and Hems., Fl. Sin. 292; Led., Fl. Ross. II, 119; Nym., Fl. Eur.; Wats., King Exp. 102; Roth., Wheel Exp. 119; Wats., Bibl. Ind. I, 356; Hart., Fl. Scand. I, 266; Greene, Fl. Fran. 228.

Cosmopolitan: Europe; Asia; S. America; Australia.

North America: Newf., Labrador, N. S. to Hudson straits, N. W. T. and Alaska; S. to Penn., Ind., Mo., N. Mex. and California.

Minn. valley: Throughout, especially in W. districts; local or rare; ponds, lakes and sluggish streams.

HERB.: *Taylor* 1151, Glenwood; *Bailey* 134, Vermilion lake; *Sandberg* 202, Red Wing.

MYRIOPHYLLUM LINN. Gen. 724 (1737).

Purshia RAF. N. Y. Med. Repos. II, 361 (1808).

Pelonastes HOOK. f. Lond. Jour. Bot. VI, 474 (1846).

Pentapterophyllum DILL. Nov. Gen. 7 (1719).

Pentapteris HALL. Helv. I, 454 (1768).

Enydria VELLOZ. Fl. Flum. I, 150 (1827).

? **Hylas** BIGEL. ex ENDL. Gen. 6135 (1840).

Beljoukandas CELT. ex Adans Fam. Pl. II, 471 (1763).

Baillon, *Hist. Pl.* VI, 298; Benth. and Hook., *Gen. Pl.* I, 676; Durand, *Ind. Gen. Phan.* 122; Schenck, *Palaeophyt.* 632

Living species: 18; cosmopolitan; North America, 12; Russia, 3; Europe, 3; E. Sts., 7; Mexico, 6; S. Sts., 4; Canada, 5; California, 2; Rocky mts., 2; Pl. King., 1.

Fossil species: Tertiary, Japan (*Nathorst*); Quaternary, Radobo (*Unger*); forest bed of Cromer? *Myriophyllites*.

Myriophyllum heterophyllum MICHX. Fl. N. Am. II, 191 (1803).

Potamogeton verticillatum WALT. Fl. Car. 90 (1788) *not* Linn.

Wats. and Coult., Gray's Man. 6 ed. 181; Mac., Fl. Can. I, 167; Upham, Fl. Minn. 56; Britt., Fl. N. J. 105; Chap., Fl. S. St. 143; Coult., Fl. Tex., 111; Morong, Torr. Bull. XVIII, 244; Cov., Fl. Ark. 182; Wats., Bibl. Ind. I, 356.

North America: Ont. to Georgian Bay; S. to N. Eng., N. Y., N. J. to Fla.; W. to Minn., Mo., Ark., La. and W. Tex.

Minn. valley: Reported from ponds and lakes, southwest districts; infrequent.

Myriophyllum verticillatum LINN. Spec. 992 (1753).

Wats. and Coult., Gray's Man. 6 ed. 181; Mac., Fl. Can. I, 167; Coult., Fl. Colo. 100; Upham, Fl. Minn. 56; Chap., Fl. S. St. 143; Hook., Fl. Gt. Brit. 153; Trautv., Fl. Sib. 55; Forbes and Hems., Fl. Sin. 293; Led., Fl. Ross. II, 118; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 50; Morong, Torr. Bull. XVIII, 242; Wats., King Exp. 102; Wats., Bibl. Ind. I, 357; Hart., Fl. Scand. I, 267.

Europe; N. Africa; N. and W. Asia to India and China.

North America: Ont. to Man. and lat. 52° N.; S. to N. Eng., N. Y., Fla.; W. to Minn., Iowa and Colo.

Minn. valley: S. central district; deep water in lakes and ponds.

HERB.: *Sheldon* 370, Duck lake, Blue Earth Co.

Myriophyllum spicatum LINN. Spec. 992 (1753).

Wats. and Coult., Gray's Man. 6 ed. 181; Britt., Fl. N. J. 105; Mac., Fl. Can. I, 166, 529; Coult., Fl. Colo. 99; Hook., Fl. Gt. Brit. 152; Brew. and Wats., Fl. Calif. I, 215; Upham, Fl. Minn. 56; Forbes and Hems., Fl. Sin. 293; Led., Fl. Ross. II, 118; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 50; Cov., Fl. Ark. 182; Wats., Bibl. Ind. I, 357; Morong, Torr. Bull. XVIII, 241; Hart, Fl. Scand. I, 267; Greene, Fl. Fran. 228.

All Europe and N. Africa; N. and W. Asia to Caucasus and India; China.

North America: Newf., N. B., Q., Ont. to Brit. Col.,

Selkirks, Bear lake, Alaska and Puget Sound; S. to N. J.; W. to Minn. and Ark.; S. to Colo. in mts.; S. to California along Sierras and Coast range.

Minn. valley: Throughout; rising near the surface of deep water in ponds and lakes.

HERB.: *Taylor* 319, Janesville; *Ballard* 901, Waconia; *Ballard* 863, Page lake, Carver Co.; *Ballard* 602, Prior's lake, Scott Co.; *Ballard* 448, Prior's lake, Scott Co.; *Taylor* 1049, Glenwood; *Sheldon* 433, Lake Elysian, Waseca Co.; *Sheldon* 371, Duck lake, Blue Earth Co.; *Oestlund* 57, Minneapolis; *Bailey* 368, Mud river; *Sheldon* 316, Madison Lake, Blue Earth Co.

LXXIX. ARALIACEAE. Ginseng Family.

Endlicher, *Gen. Pl.* 793 (1836-40); Endlicher, *Gen. Pl.* 328 (1836-40) —*Helwingiaceae*; Seem., *Journ. Bot.* II, IV (1864-66), —*Hederaceae*; Benth. and Hooker, *Gen. Plant.* I, 931 (1862-67); Baillon, *Hist. Pl.* VII, 175 (1880)—Trib. VI, sub *Ombellifères*.

Genera: 25 (Baillon); 38 (B. and H.); tropical regions, a few temperate and 1-2 in Antarctic islands.

Species: 400 ± living; 40-50 fossil; Cretaceous (Lower) to Pliocene.

ARALIA LINN. Gen. 251 (1737).

Aureliana LAFIT. Mem. Gins. (1718).

Dimorphanthus MIQ. Comm. Phyt. 95 (1838).

Baillon, *Hist. Pl.* VII, 244; Benth. and Hook., *Gen. Pl.* I, 936; Durand, *Ind. Gen. Phan.* 166; Schenck, *Palaeophyt.* 604.

Living species: 35; tropical and E. temp. Asia; N. America to Mexico. North America, 10; E. Sts., 6; Canada, 5; Rocky mts., 2; S. Sts., 6; California, 1

Fossil species: Lower Cretaceous, Potomac, Virginia (*Fontaine*—*Araliophyllum*); Upper Cretaceous, Kansas, Europe (*Lesquereaux*, *Heer*); Tertiary (*Heer*) Greenland; France (*Saporta*); Westphalia (*Schimper*—*Araliophyllum*); several species described; many of them doubtful.

Aralia trifolia (LINN.) DECN. and PLANCH. Rev. Hort. 104 (1854).

Panax trifolium LINN. Spec. 1058 (1753).

P. lanceolatum RAF. N. Fl. IV, 57 (1836).

Wats. and Coult., Gray's Man. 6 ed. 213; Britt., Fl. N. J. 119; Mac., Fl. Can. I, 189; Upham, Fl. Minn. 63; Chap., Fl. S. St. 167; Wats., Bibl. Ind. I, 436.

North America: N. S., N. Br., Q., Ont. to N. Eng., N. J., Va. and Ga.; W. to Ohio and Minn.

Minn. valley: Forest district, and reported W. to Nicollet Co.; rare; rich, deep woods.

HERB.: ? *Sandberg* 234, Minnesota?

***Aralia quinquefolia* (LINN.) DECN. and PLANCH.** Rev. Hortic. 104 (1854).

Panax quinquefolium LINN. Spec. 1058 (1753).

P. americanum RAF. N. Fl. IV, 58 (1836).

Wats. and Coult., Gray's Man. 6 ed. 213; Britt., Fl. N. J. 119; Mac., Fl. Can. I, 189, 537; Chap., Fl. S. St. 167; Upham, Fl. Minn. 63; Forbes and Hems., Fl. Sin. 338; Cov., Fl. Ark., 186; Wats., Bibl. Ind. I, 436.

Manchuria, Japan and Corea.

North America: Q., Ont. to Vt., Conn., N. J. and Ga.; W. to Ohio, Wisc., Minn. and Ark.

Minn. valley: Forest district to New Ulm, and possibly Chippewa valley; not very abundant; deep woods.

HERB.: *Ballard* 334, Belle Plaine; *Sheldon* 403, Stony Point, Lake Madison; *Taylor* 711, Minnesota lake; *Holzinger* 93, Winona Co.; *Sandberg* 233, Vasa.

***Aralia nudicaulis* LINN.** Spec. 274 (1753).

Wats. and Coult., Gray's Man. 6 ed. 213; Britt., Fl. N. J. 119; Mac., Fl. Can. I, 189, 537; Coult., Fl. Colo. 122; Chap., Fl. S. St. 166; Upham, Fl. Minn. 63; Wats., Bibl. Ind. I, 435.

North America: Newf. to Rockies, Brit. Col., Selkirk, Mackenzie river to 64° N. lat.; S. to N. J. and Ga.; W. to Minn. and Dak.

Minn. valley: Throughout; abundant; moist deep woods and ravines.

HERB.: *Taylor* 813, Glenwood; *Ballard* 296, Jordan, Scott Co.; *Sheldon* 133, Madison Lake; *Taylor* 130a, Janesville; *Ballard* 477, Prior's lake, Scott Co.; *Leonard* 19, Chatfield; *Roberts* 45, French river; *Kassube* 107, Minneapolis; *Sandberg* 232, Goodhue Co.; *Arthur* 41, Vermilion lake; *Herb. Sheld.* 1792, Minneapolis; *Herb. Wickersheim* 55, Idlewild; *Herb. Moyer* 95, Montevideo.

***Aralia hispida* VENT.** Hort. Cels 41 (1800).

A. muhlenbergiana R. and S. Syst. VI, 704 (1820).

Wats. and Coult., Gray's Man. 6 ed. 213; Britt., Fl. N. J. 119; Mac., Fl. Can. I, 189; Upham, Fl. Minn. 63; Chap., Fl. S. St. 166; Wats., Bibl. Ind. I, 435.

North America: Newf., Q., Ont. to N. Y., N. Car. and Ga.; W. to Minn. and Dak.

Minn. valley: Reported from N. E. district; Dakota Co.; local or rare; rocky woods and banks.

HERB.: *Arthur* 47, Vermilion lake; *Roberts* 44, Duluth; *Bailey* 341, St. Louis river; *Sandberg* 231, Tower.

***Aralia racemosa* LINN.** Spec. 273 (1753).

Wats. and Coult., Gray's Man. 6 ed. 213; Britt., Fl. N. J. 119; Mac., Fl. Can. I, 188; Chap., Fl. S. St. 166; Coult., Fl. Colo. 122; Upham, Fl. Minn. 63; Miyabe, Fl. Kur. 237 in var.; Wats., Bibl. Ind. I, 436; Webb., Appx. Neb. 33.

Saghalin and Japan in a varietal form.

North America: N. S., N. Br., Q., Ont. to N. Eng., N. J. and Ga.; W. to Wisc., Minn. and Neb.; base of Rocky mts. in Colo. and Mont.

Minn. valley: Forest district and banks of streams, W. to Chippewa valley; rich woodland.

HERB.: *Ballard* 404, Jordan, Scott Co.; *Sheldon* 276, Madison Lake; *Sheldon* 800, Sigel township, Brown Co.; *Taylor* 814, Glenwood; *Kassube* 106, Minneapolis; *Oestlund* 73, Hennepin Co.; *Sandberg* 230, White Rock; *Herb. Sheld.* 1708 Minneapolis.

LXXX. UMBELLIFERAE. Parsley Family.

Endlicher, *Gen. Pl.* 762 (1836-40); Lindl. Veg. King. 773 (1846)—*Apiaceae*; Bentham and Hooker, *Gen. Plant.* I, 859 (1862-67); Baillon, *Hist. Pl.* VII, 84 (1880).

Genera: 100-150; temperate regions, especially in N. hemisphere and old world; rare within the tropics.

Species: 1500±; a very few fossils from Tertiary.

***SANICULA* LINN.** Gen. 201 (1737).

***Erythrosaua* SCHM.** Max. Prim. Amur. 123 (1859).

Baillon, *Hist. Pl.* VII, 535; Benth. and Hook., *Gen. Pl.* I, 880; Durand, *Ind. Gen. Phan.* 156.

Living species: 13; Europe; temperate Asia; Sandwich Isles; Azores; N. and S. America; extra-tropical. N. America, 10; E. Sts., 1; W. sts., 9; Russia, 1; Europe, 1; Russian Europe, 1; W. Tex., 1; Canada, 6-7; Rocky mts., 1; California, 8; S. Sts. 2.

***Sanicula marylandica* LINN.** Spec. 235 (1753).

Wats. and Coult., Gray's Man. 6 ed. 212; Britt., Fl. N. J. 113; Coult., Fl. Colo. 114; Chap., Fl. S. St. 159; Mac., Fl. Can. I, 179, 533; II, 324; Webb., Fl. Neb. 124; Coult., Fl. Tex. 145; Wats., Bibl. Ind. I, 431; C. and R., Rev. N. A. Umb. 102.

North America: Newf., N. S., N. Br., Q., Ont. to

Brit. Col., Vancouver and Rockies; S. to N. Eng., N. J., Ga., Tenn.; W. to Minn., Dak., Mont., Colo., Neb., Kan., Tex.

Minn. valley: Throughout; common; woods, thickets and copses.

HERB.: *Ballard* 390, Jordan, Scott Co.; *Ballard* 73, Chaska; *Taylor* 625, Minnesota lake; *Taylor* 993, Glenwood; *Sheldon* 141, Madison Lake; *Taylor* 282, Janesville; *Sheldon* 189, Janesville; *Sheldon* 885, Sleepy Eye; *Juni* 4, Minneapolis; *Bailey* 216, Vermilion lake; *Holzinger* 86, Winona Co.; *Kassube* 94, Minneapolis; *Oestlund* 66, Ramsey Co.; *Sandberg* 215, Goodhue Co.; *Herb. Sheld.* 1794, Minneapolis; *Herb. Moyer* 89, Montevideo.

***Sanicula canadensis* LINN.** Spec. 235 (1753).

Triclinium odoratum RAF. Fl. Lud. 79 (1817).

S. marylandica var. *canadensis* TORR. Fl. U. S. 302 (1824).

S. marylandica T and G. Fl. I, 602 (1838) *in part*.

Wats. and Coult., Gray's Man. 6 ed. 212; Britt., Fl. N. J. 113; Webb. Fl. Neb. 124; Upham, Fl. Minn. 60; Mac., Fl. Can. I, 178; Chap., Fl. S. St. 159; Cov., Fl. Ark. 185; Mac., Fl. Can. I, 533; Wats., Bibl. Ind. I, 431; C. and R., Rev. N. A. Umb. 103.

North America: N. Br., Anticosti, Ont. to N. Eng., N. J., Ga. and Tenn.; W. to Minn., Dak., Neb. and E. Kan.

Minn. valley: Throughout, but infrequent; thickets and edges of woods.

HERB.: *Sheldon* 983, Cross lake, Brown Co.; *Holzinger* 85, Winona Co.

ERYNGIUM LINN. Gen. 199 (1737).

***Lessonia* BERT.** Deless. Ic. Sel. III, 45 (1837).

***Strebanthus* RAF.** Ser. Bull. I, 218 (1830).

? ***Alepidea* LAROCHE,** Hist. Eryng. 19 (1808).

Baillon, *Hist. Pl.* VII, 240; Benth. and Hook., *Gen. Pl.* 878; Durand, *Ind. Gen. Phan.* 156.

Living species: 150±; most regions except S. Africa? and frigid zones. Russia, 9; Europe, 29; Russian Europe, 4; North America, 22; E. Sts., 10; W. Sts., 9, 3 common to both; S. Sts., 8; California, 2-3.

***Eryngium aquaticum* LINN.** Spec. 232 (1753).

E. yuccaeifolium MICHX. Fl. N. Am. I, 164 (1803).

Wats. and Coult., Gray's Man. 6 ed. 211; Britt., Fl. N. J. 113; Upham, Fl. Minn. 60; Chap. Fl. S. St. 160; Coult., Fl. Tex. 143; Cov., Fl. Ark. 185; Wats., Bibl. Ind. I, 422; C. and R., Rev. N. A. Umb. 93.

North America: N. J. to Fla.; W. to Minn., Neb., Ark. and E. Tex.

Minn. valley: E. districts to Cottonwood and Chipewa valleys; dry prairies or banks.

HERB.: *Taylor* 593, Minnesota lake; *Sheldon* 1154, Sleepy Eye; *Taylor* 471, Janesville; *Sheldon* 634, Wilton, Waseca Co.; *Sheldon* 674, Waseca; *Sandberg* 216, Cannon Falls.

POLYTAENIA DC. Mem. Umbel. 53 (1829).

Baillon, *Hist. Pl.* VII, 207 (sub *Tordylium* Linn); Benth. and Hook., *Gen. Pl.* I, 922; Durand, *Ind. Gen. Phan.* 164.

Living species: 1; N. America.

Polytaenia nuttallii DC. Mem. Umbel. 53 (1829).

Pachiloma nuttallii RAF. N. Fl. IV, 33 (1836).

Wats. and Coult., Gray's Man. 6 ed. 203; Webb., Fl. Neb. 124; Coult., Fl. Colo. 121; Upham, Fl. Minn. 60; Coult., Fl. Tex. 142; Chap., Suppl. S. St. 623; Cov., Fl. Ark. 186; Wats., Bibl. Ind. I, 431; C. and R., Rev. N. A. Umb. 49.

North America: Colo. and Minn. to Neb., Ind., La. and E. Tex.

Minn. valley: Reported from S. E. edge; no Minn. specimens seen.

HERACLEUM LINN. Gen. 231 (1737).

Sphondylium TOURN. Inst. 319 (1700).

Barysoma BUNGE, Del. Sem. Dorpat. (1839).

Wendia HOFFM. Umb. 136 (1814).

Tordyliopsis DC. Prodr. IV, 199 (1830).

Trigonosciadium BOISS. Ann. sci. Nat. ser. 3, I, 344 (1844).

Stenotaenia BOISS. l. c. 339 (1844).

Baillon, *Hist. Pl.* VII, 205; Benth. and Hook., *Gen. Pl.* I, 921; Durand, *Ind. Gen. Phan.* 164.

Living species: 80 described, 60 distinct (Durand); temperate northern regions of old world; 1 sp. N. America.

Heracleum lanatum MICHX. Fl. N. Am. I, 166 (1803).

H. spondylium NUTT. Gen. I, 181 (1818).

H. panaces SPRENG. Syst. I, 912 (1825) *in part.*

H. auritum BISCH. Del. Sem. Heid. (1839).

Wats. and Coult., Gray's Man. 6 ed. 202; Britt., Fl. N. J. 118; Webb., Fl. Neb. 124; Mac., Fl. Can. I, 187; Chap., Fl. S. St. 165; Upham, Fl. Minn. 60; Coult., Fl. Colo. 121; Brew. and Wats., Fl. Calif. I, 271; Forbes and Hems., Fl. Sin. 336; Led., Fl. Ross. II, 323; Miyabe, Fl. Kur. 236; Coult., Fl. Tex. 141; Roth., Wheel. Exp. 134; Wats., Bibl. Ind. I, 423; C. and R., Rev. N. A. Umb. 48.

Altai Siberia, Manchuria, Japan, Saghalin, Kurile Isls. and Kamtk.; Russian Asia, N.

North America: Newf. and Labrador to N. J., N. Car. and Ky.; W. to Brit. Col., Alaska, Calif., Washington; S. to Minn., Colo., Neb., Tex.

Minn. valley: Throughout; low damp ground; commonly along streams.

HERB.: *Taylor* 266, Janesville; *Sheldon* 839, Sleepy Eye; *Sheldon* 391, Madison Lake; *Ballard* 115, Chaska; *Taylor* 808, Glenwood; *Oestlund* 67, Minneapolis; *Sandberg* 217, Vasa; *Herb. Moyer* 90, Montevideo.

PEUCEDANUM LINN. Gen. 212 (1737).

Pastinaca, Ferula, Imperatoria, Anethum, and Peucedanum TOURN. Inst. 316 seq. (1700).

Dorema DON, Trans. Linn. Soc. XVI, 601 (1833).

Soranthus LED. Fl. Alt. I, 344 (1830).

Xanthoselinum, Macroselinum SCHUR. Transsylv. 264 (1866).

Ormoselenia, Hammatocaulis, TAUSCH, Flora (1834-1844).

Eleocharis FENZL. Ill. Syr. 71 (1843).

Cynorrhiza, Dregea E. and Z. Enum. Afr. 350 (1837).

Bubon, Ferulago KOCH, Nov. Act. Cur. XII, 95, 97 (1825).

Alvardia, Uloptera FENZL. Flora, 461 (1834), 312 (1844).

Xanthogalum LALL. F. and M. Ind. Petr. VIII, 73 (1841).

Taeniopetalum, Scorodosma BUNGE, Rel. Lehm. (1851).

Narthex FALC. Trans. Linn. Soc. XX, 285 (1851).

Eriosynaphe DC. Prodr. IV, 175 (1830).

Oreoselinum BIEB. Fl. Taur.-Cauc. III, 200 (1819).

Steganotaenia HOCHST. Flora 347 (1834).

Sciothamnus ENDL. Gen. 780 (1840).

Euryptera NUTT. T. and G. Fl. N. Am. I, 629 (1838).

Opoidia LINDL. Bot. Reg. (1839).

Peucedanoides BOISS. Fl. Or. II, 983 (1843).

Tommasinia BERT. Fl. Ital. III, 414 (1837).

Polycyrtus SCHLECHT. Linn. XVII, 126 (1843).

Diplotaenia BOISS. Ann. Sci. Nat. ser. 3, I, 308 (1844).

Pleurotaenia HOHEN. Pl. Kotsch.

Galbanophora NECK. Elem. 292 (1790).

Pteroselinum REICH. Fl. Germ. Exc. 453 (1832).

Thysselinum HOFFM. Umb. 153 (1814).

Palimbia BESS. Volhynia, 55 (1821).

Baillon, *Hist. Pl.* VII, 204; Benth. and Hook., *Gen. Pl.* I, 917, 918; Durand, *Ind. Gen. Phan.* 163; Schenck, *Palaeophyt.* 601.

Living species: 180-220; North America, Asia, Europe, tropical and S. America, tropical and S. Africa. North America (Western), 43; Russia, 25; Europe, 30; Russian Europe, 15; Canada, 15; E. Sts., 3; California, 30?; W. Tex., 2; Pl. King, 15.

Fossil species: ?Tertiary (*Peucedanites*—Heer).

Peucedanum nudicaule (PURSH) NUTT. T. and G. Fl. I, 627 (1838).

Smyrniium nudicaule PURSH, Fl. Am. 196 (1814).

Ferula nudicaulis NUTT. Gen. I, 183 (1818).

Pastinaca nudicaulis SPRENG. R. and S. Syst. VI, 587 (1820).

Wats. and Coult., Gray's Man. 6 ed. 203; Webb., Fl. Neb. 124; Upham, Fl. Minn. 60; Coult., Fl. Colo. 120; Mac., Fl. Can. II, 329; Coult., Fl. Tex. 142; Wats., King Exp. 130; Wats., Bibl. Ind. I, 429; C. and R., Rev. N. A. Umb. 63.

North America: Minn. and Iowa to Kan., Neb. and N. Colo.; N. to Souris plain, Man., and S. to N. Tex., Arizona and N. Mex.

Minn. valley: S. W. and W. districts; rare; rocky or gravelly knolls and headlands.

HERB.: *Wickersheim* 52, Ash lake, Lincoln Co.

TIEDEMANNIA DC. Prodr. IV, 187 (1830).

Archemora DC. Prodr. IV, 188 (1830).

Neurophyllum TORR. and GR. Fl. Am. I, 612 (1838).

Oxypolis RAF. Ser. Bull. I, 217 (1830) *in part*.

Baillon, *Hist. Pl.* VII, 100; Benth. and Hook., *Gen. Pl.* I, 920; Durand, *Ind. Gen. Phan.* 164.

Living species: 4; N. America; E. Sts., 3; W. Sts., 1; Canada, 1?; S. Sts., 2.

Tiedemannia rigida (LINN.) COULT. and ROSE, Rev. Umbel. (1888).

Sium rigidius LINN. Spec. 251 (1753).

Sison marginatum MICHX. Fl. I, 168 (1803).

Archemora rigida DC. Mem. Umbel. 52 (1829).

Oxypolis rigida, denticulata, tricuspidata RAF. Bull. Soc. Gen. (1830).

Wats. and Coult., Gray's Man. 6 ed. 202; Britt., Fl. N. J. 118; Upham, Fl. Minn. 61; Chap., Fl. S. St. 165; Mac., Fl. Can. I, 188; II, 330; Cov., Fl. Ark. 186; Wats., Bibl. Ind. I, 414.

North America: Ont. and W. N. Y. to N. J.; S. to Fla. and Miss.; W. to Minn., Ark. and Tex.

Minn. valley: Reported from S. edge; infrequent; sandy, low places and along shores of lakes.

ANGELICA LINN. Gen. 218 (1737).

Archangelica HOFFM. Gen. Umbel. 166 (1814).

Czernaevia TURCZ. Baik. Dahur. I, 498 (1842).

Gingidium FORST. Char. Gen. 41, 21 (1776).

Ostercicum HOFF. Gen. Umb. 162 (1814).

Gomphopetalum TURCZ. Bull. Mosq. 537 (1841).

Callisace FISCH. Hoff. Umb. 170 (1814).

Eustylis HOOK. Fl. N. Zeal. 19 (1867).

Angelophyllum RUPR. Rev. Umbel. Kamtk. 8 (1859).

Levisticum KOCH. Umb. 101 (—).

Porphyroscias MIQ. ex Durand Ind. Phan. 163 (1888).

Baillon, *Hist. Pl.* VII, 207; Benth. and Hook., *Gen. Pl.* I, 919, 917; Durand, *Ind. Gen. Phan.* 163.

Living species: 35; N. temperate regions; New Zea-

land. N. America, 16; E. Sts., 4; W. Sts. 12; Canada, 8; S. Sts., 3.

***Angelica atropurpurea* LINN.** Spec. 251 (1753).

A. triquinata MICHX. Fl. N. Am. I, 167 (1803).

Archangelica atropurpurea HOFFM. Umbel. 161 (1814).

Imperatoria lucida NUTT. Gen. I, 181 (1818).

Wats. and Coult., Gray's Man. 6 ed. 201; Britt., Fl. N. J. 117; Upham, Fl. Minn. 61; Mac., Fl. Can. I, 185, 536; Wats., Bibl. Ind. I, 413; C. and R., Rev. N. A. Umb. 41.

North America: Labrador, Newf., N. S., N. Br., Anticosti, Q., Ont. to N. J. and Del.; W. to S. Man., L. Superior reg. and Minn.

Minn. valley: N. E. district and E. edge; Dakota Co.; reported from New Ulm; infrequent; low banks and shores.

HERB.: *Herrick* 120, Minneapolis; *Sandberg* 218, Vasa.

***Angelica villosa* (WALT.) B. S. P.** Cat. N. Y. (1888).

Ferula villosa WALT. Fl. Car. 115 (1788).

Angelica hirsuta MUHL. Cat. 2 ed. 30 (1817).

A. triquinata NUTT. Gen. I, 186 (1818).

Archangelica hirsuta T. and G. Fl. I, 622 (1838).

Wats. and Coult., Gray's Man. 6 ed. 201; Upham, Fl. Minn. 61; Mac., Fl. Can. I, 186; Chap., Fl. S. St. 164; Britt., Fl. N. J. 117; Wats., Bibl. Ind. I, 414; C. and R., Rev. N. A. Umb. 41.

North America: Ont. to Conn., N. J., Tenn. and Fla.; W. to Minn. and Mo.

Minn. valley: Reported from E. edge, rare; dry woodland and shaded river banks.

THASPIUM NUTT. Gen. I, 196 (1818).

Baillon, *Hist. Pl.* VII, 209 (sub *Aciphylla* Forst.); Benth. and Hook., *Gen. Pl.* I, 913; Durand, *Ind. Gen. Phan.* 162.

Living species: 3; N. America; 2, E.; 1, E. and W. Sts.

***Thaspium aureum* (LINN.) NUTT.** Gen. I, 196 (1818).

Smyrniium aureum LINN. Spec. 262 (1753).

Smyrniium luteum MUHL. Ind. Fl. Lanc. (1800).

Sison trifoliatum MICHX. Fl. N. Am. I, 168 (1803).

Wats. and Coult., Gray's Man. 6 ed. 204;; Mac., Fl. Can. I, 181, 534, II, 325; Britt., Fl. N. J. 116; Upham, Fl. Minn. 62; Chap., Fl. S. St. 163; Cov., Fl. Ark. 186; Wats., Bibl. Ind. I, 433; C. and R., Rev. N. A. Umb. 28.

North America: N. Eng. to N. J. and Fla.; W. to Mississippi valley.

Minn. valley: Throughout; moist banks and shores of lakes.

HERB.: *Taylor* 952, Glenwood; *Ballard* 4, Chaska; *Sheldon* 886, Sleepy Eye; *Leiberg* 22, Blue Earth Co.; *Holzinger* 87, Winona Co.; *Kassube* 100, Minneapolis; *Oestlund* 68, Ram-

sey Co.; *Herb. Sheld.* 1890, Minneapolis; *Herb. Wickersheim* 53, Idlewild.

Thaspium aureum (LINN.) NUTT. var. **cordatum** (WALT.) B. S. P. Cat. N. Y. (1888).

Smyrniium cordatum WALT. Fl. Car. 114 (1788).

S. trifoliatum MUHL. Cat. 31 (1813).

Thaspium cordatum T. and G. Fl. I, 615 (1838).

T. trifoliatum GRAY, Man. 5 ed. 195 (1867) *in part*.

T. aureum var. *trifoliatum* COULT. and ROSE, Rev. Umbel. (1889).

Wats. and Coult., Gray's Man. 6 ed. 204; Upham, Fl. Minn. 62; Mac., Fl. Can. I, 181; II, 326; Chap., Fl. S. St. 163; Coult., Fl. Colo. 117; Britt., Fl. N. J. 117; Roth., Wheel. Exp. 134; Wats., King. Exp. 125; Cov., Fl. Ark. 186; Wats., Bibl. Ind. I, 433.

North America: N. J. to Ill. and Minn.; Colo., Mont. to Rockies and Oregon; S. to Ark.; Brit. Col.

Minn. valley: Throughout; woods, banks and copses; gravelly soil.

HERB.: *Sheldon* 943, Redwood Falls; *Sheldon* 1362, Lake Benton; *Ballard* 571, Prior's lake, Scott Co.; *Sandberg* 220, Cannon Falls; *Huntington* 4, Rock Co.; *Kassube* 101, Minneapolis; *MacM.* and *Sheld.* 55, Brainerd; *Herb. Moyer* 91, Montevideo.

Thaspium barbinode (MICHX.) NUTT. Gen. I, 196 (1818).

Ligusticum barbinode MICHX. Fl. N. Am. I, 167 (1803).

Smyrniium barbinode MUHL. Cat. 31 (1813).

Wats. and Coult., Gray's Man. 6 ed. 204; Mac., Fl. Can. I, 181, 534; Britt., Fl. N. J. 117; Webb., Fl. Neb. 124; Upham, Fl. Minn. 62; Chap., Fl. S. St. 163; Cov., Fl. Ark. 186; Wats., Bibl. Ind. I, 434; C. and R., Rev. N. A. Umb. 84.

North America: S. Ont., N. Y., N. J. to Fla.; W. to Minn. and Neb.

Minn. valley: E. and C. districts at least to Lac Que Parle and Pomme des Terres valleys; riverbanks and shores.

HERB.: *Sheldon* 989, Sleepy Eye; *Sheldon* 1180, New Ulm; *Taylor* 957, Glenwood; *Taylor* 762, Glenwood; *Sheldon* 791, Sleepy Eye; *Sandberg* 219, Red Wing.

ZIZIA KOCH, Nov. Act. Cur. XII, 128 (1825).

Baillon, *Hist. Pl.* VII, 120; (sub *Carum* LINN.); Benth. and Hook., *Gen. Pl.* I, 891; (sub *Carum* Linn.); Durand, *Ind. Gen. Phan.* 159 (sub *Carum* Linn.).

Living species: 2; North America.

Zizia cordata KOCH, Umbel. 129 (1825).

Thaspium trifoliatum var. *apterum* GRAY, Man. 5 ed. 195 (1868).

Carum cordatum B. and H. Gen. Pl. I, 891 (1862).

Wats. and Coult., Gray's Man. 6 ed. 208; Britt., Fl. N. J. 117; Mac.,

Fl. Can. I, 181 *in part*; Upham, Fl. Minn. 62; Coult., Fl. Colo. 117 *in part*; Chap., Fl. S. St. 163 *in part*; Coult., Fl. Tex. 147; Wats., Bibl. Ind. I, 435; C. and R., Rev. N. Am. Umb. 127.

North America: N. Br. to N. J. and Fla.; W. to Saskatchewan, Colo. and Tex.

Minn. valley: S. and S. central districts; possibly throughout E. half; thickets and gravelly banks in shaded places.

HERB.: *Taylor* 348, Janesville.

Zizia aurea KOCH, Umbel. 129 (1825).

Thaspium aureum var. *apterum* GRAY, Man. 5 ed. 195 (1869).

Carum aureum B. and H. Gen. Pl. I, 829 (1862).

Wats. and Coult., Gray's Man. 6 ed. 208; Britt., Fl. N. J. 117; Upham, Fl. Minn. 62; Mac., Fl. Can. I, 534; II, 326; Chap., Fl. S. St. 163 *in part*; Webb., Fl. Neb. 124; Coult., Fl. Tex. 147; Wats., Bibl. Ind. I, 434; C. and R., Rev. N. A. Umb. 127.

North America: N. Br., N. Eng., N. J. to Fla.; W. to Peace and Saskatchewan rivers; S. to Minn., Neb. and Tex.

Minn. valley: S. W. and W. regions; to New Ulm and B. E. Co.; prairie districts; moist banks and shores of lakes.

HERB.: *Moyer* 92, Montevideo; *Oestlund* 351, Hennepin Co.

PIMPINELLA LINN. Gen. 236 (1737).

Bunium KOCH, Syn. Fl. Germ. ed. II, 315 (1848).

Sisarum TAUSCH, Flora, 355 (1834).

Acronema EDGEW. Trans. Linn. Soc. XX, 51 (1851).

Lereschia BOISS. Ann. Sci. Nat. ser. 3, I, 127 (1844).

Reutera BOISS. Elench. 46 (1838).

Tragium SPRENG. Prod. Umb. 26 (1813).

Ledebouria LINK, Enum. Hort. Berol. I, 286 (1821).

Chesneya BERTOL. Misc. Bot. I, 17 (1842).

Gaytania MUNST. Bot. Zeit. 730 (1843).

Gymnosciadium HOCHST. Flora, 20 (1844).

Anisum ECKL. and ZEYH. Enum. Afr. 341 (1837).

Petrosciadium EDGEW. Trans. Linn. Soc. XX, 51 (1851).

Tragopsis POMEL, ex Durand, Ind. Gen. Phan. 159 (1888).

Murritia ZOLL. Nat. Neerl. ex Hassk. Flora, 601 (1847).

Tragoselinum POMEL, ex Dur. l. c. (1888).

Anisometros HASSK. Flora, 602 (1847).

Platyraphe MIQ. ex Dur. l. c. (1888).

Heterachaena ZOLL. l. c. (1847).

Baillon, *Hist. Pl.* VII, 119 (*sub Carum* Linn.); Benth. and Hook., *Gen. Pl.* I, 893; Durand, *Ind. Gen. Phan.* 159.

Living species: 75±; N. hemisphere; also, S. Africa and S. America. North America, 3; E. Sts., 2; W. Sts., 2; Russia, 15; Europe, 11?.

Pimpinella integerrima (LINN.) BENTH. and HOOK. Gen. Pl. I, 894 (1862).

Smyrniium integerrimum LINN. Spec. 263 (1753).

Zizia integerrima DC. Rapp. Pl. Rar. Jard. Gen. III, 7 (1826).

Wats. and Coult., Gray's Man. 6 ed. 206; Mac., Fl. Can. I, 180; Upham, Fl. Minn. 62; Chap., Fl. S. St. 163; Cov., Fl. Ark. 185; Wats., Bibl. Ind. I, 430; C. and R., Rev. N. A. Umb. 109.

North America: Q., Ont. to N. Eng. and N. J. to Miss; W. to Minn., Neb., Kan. and Ark.

Minn. valley: Reported from E. edge and S. E. district; rare and local; rocky hillsides.

HERB.: *Sandberg 221*, Belle creek.

CICUTA LINN. Gen. 222 (1737).

Cicutaria TOURN. Inst. 322 (1700) *in part*.

Baillon, *Hist. Pl.* VII, 221; Benth. and Hook., *Gen. Pl.* I, 889; Durand, *Ind. Gen. Phan.* I, 158.

Living species: 6; N. hemisphere; N. America, 3; 1 only E. Sts.; 1 only W. Sts.; 1 common to both. Russia, 2; Russian Europe, 2; Europe, 2; W. Tex., 1; Pl. Wheel., 1; Pl. King, 1.

Cicuta bulbifera LINN. Spec. 255 (1753).

Cicutaria bulbifera LAM. Enc. Meth. II, 3 (1786).

Keraskomion bulbiferum RAF. N. Fl. IV, 21 (1836).

Wats. and Coult., Gray's Man. 6 ed. 208; Britt., Fl. N. J. 114; Mac., Fl. Can. I, 182; Upham, Fl. Minn. 62; Wats., Bibl. Ind. I, 416; C. and R., Rev. N. A. Umb. 130.

North America: N. S., N. Br., Q., Ont. to Del. and N. J.; W. to Hudson Bay, Saskatchewan, Minn. and Iowa.

Minn. valley: Forest district and N. W. district; absent S. W.; wet meadows, marshes and swamps.

HERB.: *Ballard 826*, Page lake, Carver Co.; *Ballard 727*, Benton, Carver Co.; *Ballard 677*, Waconia; *Taylor 1003*, Glenwood; *Herrick 121*, Minneapolis; *Holzinger 88*, Winona Co.; *Sandberg 223*, Goodhue Co.; *Holzinger 89*, Winona Co.; *Leiberg 23*, Blue Earth Co.

Cicuta virosa LINN. var. **maculata** (LINN.) COULT. and ROSE, Rev. Umbel. 130 (1889).

Cicuta maculata LINN. Spec. 256 (1753).

Cicutaria maculata LAM. Enc. Meth. II, 2 (1786).

Sium (?) *douglasii* DC. Prodr. IV, 125 (1830).

Wats. and Coult., Gray's Man. 6 ed. 208; Mac., Fl. Can. I, 181, II, 326; Upham, Fl. Minn. 62; Webb., Fl. Neb. 124; Chap., Fl. S. St. 161; Coult., Fl. Colo. 116; Brew. and Wats., Fl. Calif. I, 260; Britt., Fl. N. J. 114; Coult., Fl. Tex. 147; Roth., Wheel. Exp. 132; Wats., King Exp. 121; Cov. Fl. Ark. 185; Wats., Bibl. Ind. I, 416; Hart., Fl. Scand. I, 150 (*spec.*).

North America: Atl. provinces to Coast range of Brit. Col.; Mackenzie river to 64° N. lat.; U. S. throughout to Fla., Miss. and Tex.

Minn. valley: Throughout; wet meadows and bogs; abundant.

HERB.: *Ballard* 372, Helena, Scott Co.; *Ballard* 629, Chaska; *Ballard* 350, Helena, Scott Co.; *Taylor* 591, Minnesota lake; *Taylor* 330, Janesville; *Taylor* 990, Glenwood; *Taylor* 276, Janesville; *Sheldon* 528, Waseca; *Sheldon* 1290, Lake Benton; *Sheldon* 752, Sleepy Eye; *Taylor* 760, Glenwood; *Kassube* 102, Minneapolis; *Bailey* 251, Vermilion lake; *Oestlund* 69, Minneapolis; *Sandberg* 222, Cannon Falls; *MacM.* and *Sheld.* 40, Brainerd; *Herb. Sheld.* 1698, Minneapolis; *Herb. Moyer* 93, Montevideo.

SIUM LINN. Gen. 219 (1737).

Berula KOCH, M. and K. Deutschl. Fl. II, 433 (1826).

Sisarum TOURN. Inst. 308 (1700).

Baillon, *Hist. Pl.* VII, 222; Benth. and Hook., *Gen*, *Pl.* I, 893; Durand, *Ind. Gen. Phan.* 159.

Living species: 6; N. hemisphere and S. Africa. N. America, 2; 1, W. Sts.; 1, E. and W. Sts. Russia, 5; Europe, 3; Russian Europe, 3.

Sium angustifolium LINN. Spec. 2 ed. 1672 (1762).

Berula angustifolia KOCH, Deutsch. Fl. II, 455 (1826).

Sium pusillum NUTT. T. and G. Fl. I, 611 (1838).

Wats. and Coult., *Gray's Man.* 6 ed. 207; Upham, *Fl. Minn.* 63; Brew. and Wats., *Fl. Calif.* I, 260; Coult., *Fl. Colo.* 115; Hook., *Fl. Gt. Brit.* 173; Mac., *Fl. Can.* I, 534; Coult., *Fl. Tex.* 148; Led., *Fl. Ross.* II, 258; Wats., *King Exp.* 121; Roth, *Wheel. Exp.* 133; Cov., *Fl. Ark.* 185; Wats., *Bibl. Ind.* I, 415; C. and R., *Rev. N. Am. Umb.* 133; Hart., *Fl. Scand.* I, 154; Webb., *Appx. Neb.* 33.

Europe and Siberia.

North America: Ont. to N. Eng., Minn. and Colo.; S. to Tex. and Mex., and in Calif.

Minn. valley: S. central district; local in region of Mankato and Kasota.

HERB.: *Sandberg* 226, Goodhue Co.; *Grant* 1, Vicker-man's spring; *Leiberg* 24, Blue Earth Co.

Sium cicutaefolium K. C. GMEL. Syst. II, 482 (1806).

? *S. suave* WALT. F. Car. 115 (1788).

S. lineare MICHX. Fl. N. Am. I, 167 (1803).

S. tenuifolium MUHL. Cat. 30 (1813).

S. latifolium BIGEL. Fl. Bost. 69 (1824).

S. rugosum RAF. Med. Bot. II, 264 (1830).

Wats. and Coult., Gray's Man. 6 ed. 207; Britt., Fl. N. J. 114; Mac., Fl. Can. I, 182; Chap., Fl. S. St. 162; Brew. and Wats., Fl. Calif. I, 261; Coult., Fl. Colo. 116; Led., Fl. Ross. II, 260; Herd., Fl. Eur. Russ. 56; Coult., Fl. Tex. 146; Roth., Wheel. Exp. 133; Wats., King Exp. 121; Wats., Bibl. Ind. I, 433; C. and R., Rev. Umb. 123.

E. Russia, Altai Sib. and Dahuria.

North America: Labrador and N. Eng. to N. J., Fla. and Miss.; W. to Peace river, N. W. T., and S. throughout U. S. to Tex. and S. Calif.

Minn. valley: Throughout; in edges of sloughs, swamps and wet meadows.

HERB.: *Ballard* 897, Waconia; *Ballard* 420, New Prague, Scott Co.; *Sheldon* 1258, Lake Benton; *Sheldon* 1072, Springfield; *Taylor* 112, Janesville; *Sheldon* 1526, Lake Benton; *Roberts* 42, Devil's Neck river; *Oestlund* 70, Hennepin Co.; *Roberts* 43, Stewart river; *Bailey* 420, Long lake; *Sandberg* 224, Vasa; *Sandberg* 225, Goodhue Co.

DEERINGIA ADANS. Fam. Pl. II, 498 (1763).

? **Alcospermum** NECK. Elem. (1790).

Cryptotaenia DC. Prodr. IV, 118 (1830).

Benth. and Hook. *Gen. Pl.* I, 896; Durand, *Ind. Gen. Phan.* 159; O. Kuntze, *Rev. Gen.* I, 266.

Living species: 1; N. America and Japan.

Deeringia canadensis (LINN.) OK. *Rev. Gen.* I, 266 (1891).

Sison canadense LINN. Spec. 252 (1753).

Sium canadense LAM. Enc. Meth. I, 407 (1783).

Cicuta perennans WALT. Fl. Car. 116 (1788).

Cryptotaenia canadensis DC. Mem. Umbel. 42 (1829).

Mesodiscus simplex and *proliferus* RAF. N. Fl. IV, 20 (1836).

Wats. and Coult., Gray's Man. 6 ed. 207; Britt., Fl. N. J. 115; Mac., Fl. Can. I, 182; Upham, Fl. Minn. 63; Webb., Fl. Neb. 123; Chap., Fl. S. St. 161; Forbes and Hems., Fl. Sin. 329; Coult., Fl. Tex. 147; Cov., Fl. Ark. 185; Wats., Bibl. Ind. I, 417; C. and R., Rev. N. A. Umb. 131.

China and Japan.

North America: N. Br., Q., Ont. to N. Eng., N. J. and Ga.; W. to Saskatchewan?, Minn., Neb., E. Kan., Ark., Miss. and Tex.

Minn. valley: Throughout; thickets and edges of woods.

HERB.: *Taylor* 999, Glenwood; *Taylor* 274, Janesville; *Sheldon* 236, Lake Washington, Blue Earth Co.; *Sheldon* 888, Sleepy Eye; *Ballard* 208, Jordan; *Taylor* 666, Cobb river, Blue Earth Co.; *Taylor* 806, Glenwood; *Holzinger* 90, Winona Co.; *Oestlund* 71, Hennepin Co.; *Sandberg* 227, Chisago Co.; *Herb. Sheld.* 1772, Ft. Snelling.

MYRRHIS SCOP. Fl. Carn. I, 207 (1760).*Lindera* ADANS. Fam. Pl. II, 499 (1763).*Osmorhiza* RAF. Journ. Phys. LXXXIX, (1819).*Uraspermum* NUTT. Gen. I, 192 (1818) *not Scop.**Glycosma* NUTT. T. and G. Fl. Am. I, 639 (1838).*Spermatura* REICH. Consp.Baillon, *Hist. Pl.* VII, 233; Benth. and Hook., *Gen. Pl.* I, 897; Durand, *Ind. Gen. Phan.* 160; O. Kuntze, *Rev. Gen.* I, 270.

Living species: 10; temperate N. hemisphere; S. America. N. America, 6; E. Sts., 2; W. Sts., 4.

Myrrhis claytoni MICHX. Fl. N. Am. I, 170 (1803).*Scandix dulcis* MUHL. Cat. 31 (1813).*Osmorhiza dulcis* RAF. Sp.? (1817).*Uraspermum hirsutum* BIGEL. Fl. Bost. ed. 2, 112 (1824).*Osmorhiza brevistylis* DC. Prodr. IV, 232 (1830).*O. claytoni* B. S. P. Cat. N. Y. (1888).*Uraspermum aristatum* var. *brevistyle* OK. Rev. Gen. I, 270 (1891), Wats. and Coult., Gray's Man. 6 ed. 210; Mac., Fl. Can. I, 183; Britt., Fl. N. J. 115; Upham, Fl. Minn. 63; Chap., Fl. S. St. 166; Wats., King Exp. 122; Cov., Fl. Ark. 185; Wats., Bibl. Ind. I, 427; C. and R., Rev. N. A. Umb. 118.

Japan?; Asia?.

North America: N. S., N. Br., Q., Ont. to N. J., Va. and N. Car.; W. to Rocky mts. in Canada; Dak., Kan., Ark. and Tex.

Minn. valley: Throughout; habitat like that of *M. aristata* (Thunb.).HERB.: *Sheldon* 83, Elysian; *Sheldon* 174, Eagle lake, Blue Earth Co.; *Sheldon* 137, Madison Lake; *Sheldon* 887, Sleepy Eye; *Ballard* 700, Waconia; *Ballard* 75, Chaska; *Kassube* 104, Minneapolis; *Oestlund* 72, Hennepin Co; *Holzinger* 92, Winona; *Sandberg* 229, Cannon Falls; *Herb. Sheld.* 1773, Ft. Snelling; *Herb. Moyer* 94, Montevideo.**Myrrhis aristata** (THUNB.).*Chaerophyllum aristatum* THUNB. Fl. Jap. (1784).*Uraspermum claytoni* NUTT. Gen. I, 193 (1818).*Myrrhis longistylis* TORR. Fl. U. S. 310 (1824).*Osmorhiza villosa* and *cordata* RAF. Med. Bot. II, 249 (1830).*O. longistylis* DC. Prodr. IV, 232 (1830).*Uraspermum aristatum* OK. Rev. Gen. I, 270 (1891) *part.*

Wats. and Coult., Gray's Man. 6 ed. 210; Britt., Fl. N. J. 115; Mac., Fl. Can. I, 183, 534; Upham, Fl. Minn. 63; Webb., Fl. Neb. 124; Coult., Fl. Colo. 116; Cov., Fl. Ark. 185; Wats., Bibl. Ind. I, 427; C. and R., Rev. Umb. N. A., 118.

Japan.

North America: N. S., N. Br., Q., Ont. to N. J. and

mts. of N. Car.; W. to Saskatchewan, N. W. T., Minn., Dak., Neb. and Ark.

Minn. valley: Throughout; rich woodland and river-banks.

HERB.: *Ballard* 134, Chaska; *Taylor* 894, Glenwood; *Sheldon* 431, Janesville; *Kassube* 103, Minneapolis; *Holzinger* 91, Winona Co.; *Sandberg* 228, Cannon Falls; *Herb. Wickersheim* 54, Ash lake, Lincoln Co.

LXXXI. CORNACEAE. Dogwood Family.

Endlicher, *Gen. Pl.* 798 (1836-40); Endlicher, *Gen. Pl.* 1184 (1836-40)—*Alangiaceae*; Endlicher, l. c. 288—*Garryaceae*; Endlicher, l. c. 295—*Nyssaceae*; Bentham and Hooker, *Gen. Plant.* I, 927 (1862-67); Baillon, *Hist. Pl.* VII, 66 (1880).

Genera: 8; temperate regions, especially in N. hemisphere.

Species: 85± living; 30-40 fossil in Cretaceous, Tertiary and Quaternary rocks.

CORNUS LINN. Gen. 80 (1737).

Benthamia LINDL. Bot. Reg. 1579 (1833).

Microcarpium SPACH, Suit. Buff. VIII, 90 (1839).

Benthamidia SPACH, Suit. Buff. VIII, 90 (1839).

Baillon, *Hist. Pl.* VII, 79; Benth. and Hook., *Gen. Pl.* I, 950; Durand, *Ind. Gen. Phan.* 168; Schenck, *Palaeophyt.* 614.

Living species: 25±; Europe; Asia to Himalayas; N. America; Mexico; Peru. N. America, 18; Canada, 13; E. Sts., 9; S. Sts., 6; California, 7; Pl. King., 2; Pl. Wheel., 1; W. Tex., 4; Rocky mts., 3; Russia, 6; Europe, 4; Russian Europe, 4.

Fossil species: Several descr. from Upper Cretaceous of Greenland (*Heer*); Tertiary, many species, France (*Saporta*); Greenland, Alaska, Spitzbergen, Wyoming, Saghalin, Switzerland (*Heer*, *Lester Ward*, *Lesquereaux*, *Newberry*); Java (*Göppert*); 30-40 spec.

Cornus canadensis LINN. Spec. 117 (1753).

C. herbacea var. *canadensis* PALL. Fl. Ross. I, 52 (1784).

Wats. and Coult., *Gray's Man.* 6 ed. 214; Mac., Fl. Can. I, 190, 538; Britt., Fl. N. J. 120; Coult., Fl. Colo. 122; Brew. and Wats., Fl. Calif. I, 274; Upham, Fl. Minn. 64; Forbes and Hems., Fl. Sin. 344; Led., Fl. Ross. II, 378; Miyabe, Fl. Kur. 237; Wats., *Bibl. Ind.* I, 438.

Manchuria; Mid. Japan; E. Corea; Kurile Isls.

North America: Atl. to Pac. in Can.; Alaska; S. to N. J., Ind., Minn., Colo. and Calif.

Minn. valley: N. W. and N. E. districts; rare or local; cold woods and with tamarack (*Larix americana*).

HERB.: *Taylor* 1110, Glenwood; *Roberts* 46, Poplar river; *Oestlund* 74, Ramsey Co.; *Winchell* 7, Duluth; *Leonard* 20, Duluth; *Roberts* 47, Duluth; *Arthur* 15, Vermilion lake; *Bailey* 287, Vermilion lake; *Sandberg* 235, Tower; *Manning* 5, Mount Pleasant.

***Cornus alternifolia* LINN. f. Suppl. 125 (1781).**

C. alternata MARSH. Arbust. Amer. 35 (1785).

Wats. and Coult., Gray's Man. 6 ed. 215; Mac., Fl. Can. I, 191, 538; Britt., Fl. N. J. 121; Upham, Fl. Minn. 64; Chap., Fl. S. St. 167; Wats., Bibl. Ind. I, 437.

North America: N. S., N. Br., Q., Ont. to S. Man.; S. to N. J., Ga., Alab.; W. to Minn. and Mo.

Minn. valley: Forest district and W. to Cottonwood and Chippewa valleys; shaded banks and hillsides.

HERB.: *Sheldon* 508, Waseca; *Sheldon* 720, Sleepy Eye; *Ballard* 158, Chaska; *Holzinger* 98, Winona; *Sandberg* 240, Cannon Falls.

***Cornus candidissima* MARSH. Arbust. Amer. 35 (1785).**

? *C. racemosa* LAM. Enc. Meth. II, 116 (1786).

C. stricta LAM. Enc. Meth. II, 116 (1786).

C. paniculata L'HER. Corn. 9 (1788).

C. albidu EHRH. Beitr. IV, 16 (1789).

Wats. and Coult., Gray's Man. 6 ed. 215; Britt., Fl. N. J. 120; Webb., Fl. Neb. 124; Mac., Fl. Can. I, 191; Upham, Fl. Minn. 64; Chap., Fl. S. St. 167; Coult., Fl. Tex. 151; Cov., Fl. Ark. 187; Wats., Bibl. Ind. I, 439.

North America: N. S., Ont. to N. J. and N. Car.; W. to Minn., Neb., Ark. and Tex.

Minn. valley: Throughout, but rare W. of forest district and Cottonwood river; thickets, shores of lakes, along streams.

HERB.: *Ballard* 743, Waconia; *Ballard* 353, Helena, Scott Co.; *Ballard* 97, Shakopee; *Taylor* 334, Janesville; *Sheldon* 716, Sleepy Eye; *Taylor* 260, Janesville; *Sheldon* 390, Madison Lake; *Sheldon* 323, Smith's Mill, Blue Earth Co.; *Oestlund* 78, Hennepin Co.; *Oestlund* 79, Ramsey Co.; *Herrick* 124, Minneapolis; *Herrick* 125, Minneapolis; *Holzinger* 97, Winona Co.; *Moyer* 260, Big Spring, Lac Que Parle Co.

***Cornus asperifolia* MICHX. Fl. N. Am. I, 93 (1803).**

C. sericea var. *asperifolia* DC. Prodr. IV, 272 (1830).

Wats. and Coult., Gray's Man. 6 ed. 214; Mac., Fl. Can. I, 191; Webb., Fl. Neb. 124; Chap., Fl. S. St. 167; Upham, Fl. Minn. 64; Coult., Fl. Tex. 150; Cov., Fl. Ark. 186; Wats., Bibl. Ind. I, 437.

North America: Ont. to N. J., N. Car. and Fla.; W. to Minn., Neb., Ark. and Tex.

Minn. valley: Reported from forest district and to Blue Earth Co.; rare or local; dry or gravelly places.

HERB. *Sandberg* 239, Cannon Falls.

Cornus stolonifera MICHX. Fl. N. Am. I, 92 (1803).

C. sanguinea MARSH. Arbust. Amer. 36 (1785).

C. alba LAM. Enc. Meth. II, 115 (1786) *in part*.

? *C. baileyi* COULT. and ROSE, Bot. Gaz. XX, 37 (1890).

Wats. and Coult., Gray's Man. 6 ed. 214; Britt., Fl. N. J. 120; Webb., Fl. Neb. 124; Mac., Fl. Can. I, 191; Coult., Fl. Colo. 122; Upham, Fl. Minn. 64; Wats., Bibl. Ind. I, 440.

North America: Atl. to Pac. in Can.; Mackenzie river to lat. 64° N.; W. to Colo., Minn., Neb. and Arizona; S. to N. J.

Minn. valley: Forest district and W. to Cottonwood valley; wet meadows, edges of sloughs and bogs.

HERB: *Ballard* 55, Chaska; *Taylor* 805, Glenwood; *Sheldon* 1583, Lake Benton; *Sheldon* 719, Sleepy Eye; *Bailey* 12, Vermilion lake; *Juni* 5, Duluth; *Bailey* 250, Vermilion lake; *Oestlund* 77, Hennepin Co.; *Holzinger* 94, Winona; *Kassube* 109, Minneapolis; *Holzinger* 95, Winona Co.; *Sandberg* 838, Goodhue Co.; *Holzinger* 96, Winona Co.; *Herb. Sheld.* 1886, Minneapolis.

Cornus sericea LINN. Mant. II, 199 (1767).

C. alba WALT. Fl. Car. 88 (1788).

C. lanuginosa MICHX. Fl. N. Am. I, 92 (1803).

C. obliqua RAF. Ann. Nat. 13 (1820).

Wats. and Coult., Gray's Man. 6 ed. 214; Britt., Fl. N. J. 120; Mac., Fl. Can. I, 191; Webb., Fl. Neb. 124; Chap., Fl. S. St. 167; Upham, Fl. Minn. 64; Coult., Fl. Tex. 150; Wats., King Exp. 132; Cov., Fl. Ark. 187; Wats., Bibl. Ind. I, 436.

North America, N. Br., Q., Ont. to N. Eng., N. J., Fla. and La.; W. to Minn., Dak., Neb., Ark. and E. Tex.

Minn. valley: Throughout; wet meadows and edges of quaking bogs.

HERB.: *Kassube* 108, Minneapolis; *Herrick* 123, Minneapolis; *Oestlund* 76, Hennepin Co.; *Bailey* 64, Vermilion lake; *Sandberg* 237 Red Wing; *Herb. Sheld.* 1287, Minneapolis; *Herb. Wickersheim* 56, Idlewild.

Cornus circinatus L'HER. Corn. 7 (1788).

Wats. and Coult., Gray's Man. 6 ed. 214; Mac., Fl. Can. I, 190; Britt., Fl. N. J. 120; Upham, Fl. Minn. 64; Wats., Bibl. Ind. I, 438.

North America: N. S., Q., Ont. to N. J. and Va.; W. to L. Superior reg., Minn., Dak. and Mo.

Minn. valley: Throughout; thickets, edges of woods and dry copses.

HERB.: *Taylor* 934, Glenwood; *Sheldon* 85, Elysian; *Taylor* 798, Glenwood; *Herrick* 122, Minneapolis; *Sandberg* 236, Chisago Co.; *Roberts* 48, Carlton's Peak; *Roberts* 49, Duluth; *Oestlund* 75, Hennepin Co.

METACHLAMYDEAE.

LXXXII. PIROLACEAE. Pine-Sap Family.

Lindl. *Veg. King.* 450, 452 (1846)—*Monotropaceae*; Benth and Hooker, *Gen. Pl.* II, 581, 604 (1876)—Trib. V, *Ericaceae* and *Monotropeae*; Drude in *Engler and Prantl, Nat. Pflanz.* IV, 1, 2 (1889); Baillon, *Hist. Pl.* XI, 150. (1892).

Genera: 10; N. boreal and temperate regions to Orizaba mt. and Himalayas; especially N. American; N. to Arctic circle.

Species: 30± living; 1–2 doubtful, extinct; Tertiary of Europe and Polar regions?

PSEVA RAF. *Jour. Phys.* LXXIX, 261 (1809).

Chimaphila PURSH, *Fl. Am.* Sept. I, 279 (1814).

Benth. and Hook., *Gen. Pl.* II, 603; Durand, *Ind. Gen. Phan.* 246; Engler and Prantl. *Nat. Pflanz.* 4, I, 8; O. Kuntze, *Rev. Gen.* II, 390; Baillon, *Hist. Pl.* XI, 151 (*sub Pirola*).

Living species: 4; Europe, N. America to Mexico; Japan and Corea. N. America, 3; Canada, 3; California, 2; E. Sts., 2; S. Sts., 2; Pl. King, 1.

Pseva maculata (LINN.) OK. *Rev. Gen.* II, 390 (1891).

Pyrola maculata LINN. *Spec.* 565 (1753).

Chimaphila maculata PURSH, *Fl. Am.* 300 (1814).

Wats. and Coult., *Gray's Man.* 6 ed. 323; Britt., *Fl. N. J.* 163; Chap., *Fl. S. St.* 267; Upham, *Fl. Minn.* 95; Mac., *Fl. Can.* I, 306; II, 309; Cov., *Fl. Ark.* 201; Gray, *Syn. Fl.* II, 1, 45.

North America: Ont. to Minn., S. to N. Eng., Ga. and Miss.; W. to Ark.

Minn. valley: Reported from N. E. district and N. edge; no Minn. specimens seen.

Pseva umbellata (LINN.) OK. *Rev. Gen.* II, 390 (1891).

Pyrola umbellata LINN. *Fl. Dan.* 1336 (1757).

Chimaphila corymbosa PURSH, *Fl. Am.* 300 (1814).

C. umbellata NUTT. *Gen.* I, 274 (1818).

Pyrola corymbosa BERTOL. *Misc.* III, 12 (1844).

Wats. and Coult., *Gray's Man.* 6 ed. 323; Britt., *Fl. N. J.* 163; Mac., *Fl. Can.* I, 306; Chap., *Fl. S. St.* 267; Upham, *Fl. Minn.* 95; Brew. and Wats., *Fl. Calif.* I, 459; Nym., *Fl. Eur.*; Herd., *Fl. Eur. Russ.* 84; Wats., *King Exp.* 212; Engl. Drude, *Nat. Pflanz.* IV, 1, 8; Gray, *Syn. Fl.* II, 1, 45.

N. Europe to Switzerland, Bohemia, Poland; N. Asia to Japan.

North America: N. S., N. Br. Q., Ont. to Brit. Col.

and Vancouver; S. in Sierras to Mendocino Co., Calif.; to Minn. and Wisc., and E. to N. Eng., N. J., Ga. and Mexico.

Minn. valley: Reported from N. edge and N. E. district; dry woods.

HERB.: *Roberts* 85, Minnesota Point; *Roberts* 86, Devil's Neck river; *Bailey* 189, Vermilion lake; *Bailey* 416, Long lake; *Sandberg* 386, White rock.

PIROLA LINN. Gen. 345 (1737).

Moneses SALISB. S. F. Gray, Nat. Arr. II, 403 (1821).

Actinocyclus KLOTZSCH, Monatb. Berl. 14 (1857).

Amelia and **Thelaia** ALEF. Linn. XXVIII, 18 (1852).

Benth. and Hook., *Gen. Pl.* II, 602, 603; Durand, *Ind. Gen. Phan.* 245, 246; Engler and Prantl, *Nat. Pflanz.* 4, I, 8 (Drude); Baillon, *Hist. Pl.* XI, 150.

Living species: 15-25; N. temperate and boreal regions, to Mexico and Himalayas. Europe, 5; Asia, 10; N. America, 8-14; Canada, 7-8; S. Sts., 1; Rocky mts., 6; E. Sts., 6; California, 5; Pl. Wheel., 3; Pl. King, 3.

Pirola secunda LINN. Spec. (1753).

Wats. and Coult., Gray's Man. 6 ed. 324; Britt., Fl. N. J. 163; Upham, Fl. Minn. 95; Mac., Fl. Can. I, 304; Coult., Fl. Colo. 230; Brew. and Wats., Fl. Calif. I, 460; Trautv., Fl. Sib. 81 in var.; Nym., Fl. Eur.; Hook., Fl. Gt. Brit. 256; Led., Fl. Ross. II, 930; Miyabe, Fl. Kur. 248; Herd., Fl. Eur. Ross. 84; Roth., Wheel. Exp. 184; Wats., King Exp. 211; Engl. Drude, Nat. Pflanz. IV, 1, 9; Gray, Syn. Fl. II, 1, 46; Hart., Fl. Scand. I, 324; Webb., Appx. Neb. 36.

N. Europe; Scand. to Mt. Olympus and Pyrenees; N. Asia to Manchuria, Japan, Corea and Saghalin.

North America: Greenland and Newf. to Mackenzie and Pac.; S. in Sierras to Donner Pass; S. in mts. to Colo. and N. Mex.; S. to Minn., Neb., Mich., Mo. and N. J.

Minn. valley: Forest district to Redwood Falls; rare; rich, damp woods and banks of streams.

HERB.: *Sandberg* 385, Cannon Falls; *Arthur* 14, Vermilion lake; *Roberts* 82, Black Point; *Roberts* 83, Grand Marais; *Roberts* 84, Knife river; *Bailey* 166, Vermilion lake; *Bailey* 78, Vermilion lake; *Bryant* 1, Minneapolis.

Pirola secunda LINN. var. **pumila** GRAY, Man. 5 ed. 302 (1867).

Wats. and Coult., Gray's Man. 6 ed. 324; Mac., Fl. Can. I, 304; Upham, Fl. Minn. 95; Gray, Syn. Fl. II, 1, 46.

Greenland, Labrador to Alaska; S. to L. Superior, Minn. and N. Y.; S. to Colo. and Calif. in mts.

Minn. valley: Reported from N. E. district; no Minn. specimens seen.

Pirola elliptica NUTT. Gen. I, 273 (1818).*P. rotundifolia* MICHX. Fl. N. Am. I, 251 (1803) *in part*.

Wats. and Coult., Gray's Man. 6 ed. 324; Britt., Fl. N. J. 163; Coult., Fl. Colo. 230; Mac., Fl. Can. I, 304; 563; Gray, Syn. Fl. II, 1, 47.

Japan.

North America: N. S., N. Br., Q., Ont. to Owen sound, S. Man. and valley of the Saskatchewan; S. in Rockies to N. Mex.; S. to Minn., Iowa, N. Eng., N. J. and Ind.

Minn. valley: Forest district and N. W. district; rich woods and tamarack swamps.

HERB.: *Ballard* 874, Waconia; *Ballard* 414, New Prague, Scott Co.; *Ballard* 132, Chaska; *Ballard* 470, Prior's lake, Scott Co.; *Ballard* 402, Jordan, Scott Co.; *Ballard* 358, Helena, Scott Co.; *Sheldon* 612, Wilton, Waseca Co.; *Taylor* 382, Janesville; *Leonard* 31, Fillmore Co.; *Kassube* 156, Minneapolis; *Herrick* 187, Minneapolis; *Sandberg* 384, Red Wing; *Herb. Sheld.* 1686, Minneapolis.**Pirola rotundifolia** LINN. Lam. III. 367 (1791).*P. rotundifolia* var. *incarnata* DC. Prodr. VII, 773 (1839).Wats. and Coult., Gray's Man. 6 ed. 324; Britt., Fl. N. J. 162; Mac., Fl. Can. I, 305, 563; Coult., Fl. Colo. 230; Chap., Fl. S. St. 267; Brew. and Wats., Fl. Calif. I, 460. Forbes and Hems., Fl. Sin. II, 32; Led., Fl. Ross. II, 928; Trautv., Fl. Sib. 81 *in var.*; Nym., Fl. Eur.; Hook., Fl. Gt. Brit. 256; Herd., Fl. Eur. Russ. 84; Wats., King Exp. 211; Engl. Drude, Nat. Pflanz. IV, 1, 1; Gray, Syn. Fl. II, 1, 47, Hart., Fl. Scand. I, 323.

Europe except Greece and Turkey; N. Asia to China, Japan and Kamtk.

North America: Atl. to Pac. and Arctic circle in Can.; S. to N. J. and N. Ga.; S. to Oregon and Calif. and to Minn. and N. Mex. in mts.

Minn. valley: N. E. and N. W. districts and along N. edge; woods and tamarack swamps.

HERB.: *Taylor* 1114, Glenwood; *Juni* 10, Duluth; *Herrick* 184, St. Louis river; *Sandberg* 382, Chisago Co.; *Sandberg* 383, Cannon Falls; *Roberts* 81, Duluth; and *in forma incarnata* (DC.), *Ballard* 143, Chaska; *Ballard* 413, New Prague, Scott Co.**Pirola rotundifolia** LINN. var. **uliginosa** (TORR.) GRAY, Man. 2 ed. 259 (1852).*P. uliginosa* TORR. Fl. N. Y. I, 452 (1843).*P. obovata* BERTOL. Misc. III, 11 (1844).

Wats. and Coult., Gray's Man. 6 ed. 324; Mac., Fl. Can. I, 305; Upham, Fl. Minn. 94; Coult., Fl. Colo. 231; Roth., Wheel. Exp. 184; Gray, Syn. Fl. II, 1, 48.

North America; N. Br. to Cariboo mts., Brit. Col.; S. to Minn. and N. Eng.

Minn. valley: N. E. district; tamarack swamps and woods.

HERB.: *Herrick 185*, Minneapolis; *Herrick 186*, Minneapolis.

MONOTROPA LINN. Gen. 315 (1737).

Hypopitys SCOP. Fl. Carn. I, 285 (1760).

Benth. and Hook., *Gen. Pl.* II, 607; Durand, *Ind. Gen. Phan.* 246; Engler and Prantl, *Nat. Pflanz.* 4, I, 10 (Drude); Schenck, *Palaeophyt.* 733 Baillon, *Hist. Pl.* XI, 152.

Living species: 3; N. America to Mexico; Europe; Asia to India and Japan. N. America, 3; 1 sp. endemic.

Fossil species: Miocene of Oeningen (*Heer*),

Monotropa uniflora LINN. Spec. 555 (1753).

M. morisoniana MICHX. Fl. N. Am. I, 226 (1803).

M. morisoni PERS. Syn. I (1805).

Wats. and Coult., Gray's Man. 6 ed. 325; Upham, Fl. Minn. 95; Britt., Fl. N. J. 164; Chap., Fl. S. St. 268; Mac., Fl. Can. I, 307; Coult., Fl. Colo. 231; Brew. and Wats., Fl. Calif. I, 463; Cov., Fl. Ark. 201; Forbes and Hems., Fl. Sin. II, 34; Engl. Drude, Nat. Pflanz. IV, 1, 10; Gray, Syn. Fl. II, 1, 49; Webb., Appx. Neb. 36; Coult., Fl. Tex. 254.

Asia; Japan to Himalayas and N. India; S. America.

North America: Anticosti, N. S., N. Br., Q., Ont. to S. Man., Oregon and Rockies; S. to Colo. and Mexico; S. to Minn., Neb., Mo., Ark., Tex., and E. to Miss., Fla. and Atl. coast.

Minn. valley: Forest district; rare; deep, rich woodland.

HERB: *Bailey 156*, Vermilion lake; *Sandberg 387*, "Minnesota"; *Lange 5*, St. Anthony Park.

LXXXIII. ERICACEAE. Heath Family.

Endlicher, *Gen. Pl.* 750 (1836-40); Lindl., *Veg. Kingd.* 757 (1846)—*Vacciniaceae*; Bentham and Hooker, *Gen. Plant.* II, 564, 577 (1876)—excl. *Pirolaceae* and *Clethraceae*; Drude in Engler and Prantl, *Nat. Pflanz.* IV, 1, 15 (1889); Baillon, *Hist. Pl.* XI, 122 (1892) in part.

Genera: 65 living; 3 fossil; cosmopolitan.

Species: 1350±; rather more abundant in N. than in S. hemisphere; 30-40 fossil; doubtful.

LEDUM LINN. Gen. 342 (1737).

Dulia ADANS. Fam. Pl. II, 165 (1763).

Benth. and Hook., *Gen. Pl.* II, 599; Durand, *Ind. Gen. Phan.* 245; Engler and Prantl, *Nat. Pflanz.* 4, I, 34 (Drude); Schenck, *Palaeophyt.* 728; Baillon, *Hist. Pl.* XI, 130.

Living species: 3; 2, N. America; 1, circumboreal.

Fossil species: Tertiary, Sager, Radoboj (*Unger*); Miocene, Thüringen (*von Fritsch*).

Ledum latifolium AIT. Lam. Ill. 363 (1791).

L. groenlandicum RETZ. Scand. (1799).

L. palustre var. *latifolium* MICHX. Fl. N. Am. I (1803).

Wats. and Coult., Gray's Man. 6 ed. 321; Mac., Fl. Can. I, 301; Upham, Fl. Minn. 94; Engl. Drude, Nat. Pflanz. IV, 1, 34; Gray, Syn. Fl. II, 1, 43.

North America: Greenland, Labrador, Newf., N. Br. to Pac.; S. to Minn., Mich., N. N. Eng. and Penn.

Minn. valley: Far N. district and possibly N. W.; woods and barrens.

HERB.: *Roberts* 80, Duluth; *Bailey* 257, Vermilion lake; *Sandberg* 381, Chisago Co.; *MacM.* and *Sheld.* 31, Brainerd.

ANDROMEDA LINN. Gen. 344 (1737) em. BENTH. l. c. (1876).

Benth. and Hook., *Gen. Pl.* II, 587; Durand, *Ind. Gen. Phan.* 243; Engler and Prantl, *Nat. Pflanz.* 4, I, 42 (Drude); Schenck, *Palaeophyt.* 722; Baillon, *Hist. Pl.* XI, 131, *in part*.

Living species: 1; circumboreal and to temperate regions.

Fossil species: Numerous in Cretaceous of N. America; 10-20 (*Lesquereaux*, *Heer*, *Ward*, *Newberry*); Tertiary, Europe (*Saporta*, *Ettinghausen*, *Heer*, *Unger*); Switzerland, Spitzbergen, Alaska, Greenland; Tertiary N. America, Alaska, Florissant, etc.; 40-50 spec. described; to be much reduced.

Andromeda polifolia LINN. Spec. 393 (1753).

A. rosmarinifolia PURSH, Fl. Am. 291 (1814).

A. glaucophylla LINK, Enum. I, 394 (1821).

Wats. and Coult., Gray's Man. 6 ed. 316; Britt., Fl. N. J. 161; Mac., Fl. Can. I, 297; Upham, Fl. Minn. 94; Trautv., Fl. Sib. 80; Nym., Fl. Eur.; Hook., Fl. Gt. Brit. 252; Herd., Fl. Eur. Russ. 82; Engl. Drude, Nat. Pflanz. IV, 1, 44; Gray, Syn. Fl. II, 1, 31; Hart., Scand. Fl. I, 319.

Europe to Tyrol and Hungary; N. Asia.

North America: Labrador and Greenland to Pac. and Arctic ocean; S. to Minn., Penn. and N. J.

Minn. valley: N. E. district; rare; deep, rich woods or barrens.

HERB.: *Bailey* 280, St. Louis River; *Bailey* 295, St. Louis river; *Sandberg* 380, Chisago Co.

LYONIA NUTT. Gen. I, 266 (1818).

Cassandra and **Pieris** DON, Edin. Phil. Journ. XVII, 158-159 (1834).

? **Aegialea** KLOTZSCH, Walp. Ann. II, 1113 (1850).

Portuna NUTT. Trans. Phil. Soc. VIII (1843).

Benth. and Hook., *Gen. Pl.* II, 584-587; Durand, *Ind. Gen. Phan.* 243; Engler and Prantl, *Nat. Pflanz.* 4, I, 44; Baillon, *Hist. Pl.* XI, 133 (*sub Andromeda*).

Living species: 8-18?; N. America, E. Asia and 1 sp. circumboreal. N. America, 7; Canada, 3; E. Sts., 7; S. Sts., 7.

Lyonia calyculata (LINN.) REICH. Fl. Ex. I, 414 (1827).

Andromeda calyculata LINN. Spec. 566 (1753).

Chamaedaphne calyculata MOENCH, Meth. (1794).

Cassandra calyculata DON, Edinb. Journ. XVII, 159 (1834).

Wats. and Coult., Gray's Man. 6 ed. 318; Britt., Fl. N. J. 160; Mac., Fl. Can. I, 296; Chap., Fl. S. St. 262; Upham, Fl. Minn. 93; Trautv., Fl. Sib. 80; Herd., Fl. Eur. Russ. 82; Gray, Syn. Fl. II, 1, 35.

N. Europe and N. Asia.

North America: Labrador to N. Br., Q., Ont., Brit. Col. and Alaska at Kotzebue Sound; S. to N. Eng., N. J. and Ga.; W. to Minn. and Man.

Minn. valley: N. E. district; rare; possibly also N. W.; bogs and edges of swamps.

HERB.: *Roberts* 79, Minnesota Point; *Bailey* 228, Vermilion lake; *Sandberg* 379, Chisago Co.

CHIOGENES SALISB. Trans. Hort. Soc. Lond. II, 94 (1812).

Phalerocarpus G. DON, Gen. Syst. III, 641 (1834).

Lasierpa TORR. Fl. N. Y. I, 450 (1843).

Benth. and Hook., *Gen. Pl.* II, 577; Durand, *Ind. Gen. Phan.* 242; Engler and Prantl, *Nat. Pflanz.* 4, I, 47 (Drude); Baillon, *Hist. Pl.* XI, 183.

Living species: 1; N. America and Japan. (Some authorities regard the Japanese form as distinct. It seems, however, of varietal rank).

Chiogenes hispidula (LINN.) TORR. Fl. N. Y. I, 450 (1843).

Vaccinium hispidulum LINN. Spec. 500 (1753).

Arbutus fliformis LAM. Enc. Meth. I, 228 (1783).

A. thymifolia AIT. Hort, Kew. II, 72 (1789).

Oxycoccus hispidulus PERS. Syn. I, 419 (1805).

Chiogenes serpyllifolia SALISB. Trans. Hort. Soc. Lond. II, 94 (1812).

Gaultheria serpyllifolia PURSH, Fl. Am. 283 (1814).

Glycyphylla hispidula RAF. Am. Mo. Mag. (1819).

Phalerocarpus serpyllifolius DON, Syst. III, 841 (1834).

Chiogenes japonica GRAY, Syn. Fl. II, 1, 26 (1886).

Wats. and Coult., Gray's Man. 6 ed. 315; Mac., Fl. Can. I, 294, 561; Upham, Fl. Minn. 93; Britt., Fl. N. J. 159; Chap., Suppl. S. St. 633; Engl. Drude, *Nat. Pflanz.* IV, 1, 47; Gray, Syn. Fl. II, 1, 26.

Japan.

North America: Labrador, Newf., N. S., N. Br. to

West of Rockies, Selkirks, Columbia river and N. W. T.; S. to Minn., Penn., N. J. and in Appalachians to N. Car.

Minn. valley: N. W. and N. E.; tamarack swamps; rare; sphagnum marshes.

HERB.: *Roberts* 76, Devil's Neck river; *Sandberg* 377, Center City.

ARCTOSTAPHYLOS ADANS. Fam. Pl. II, 165 (1763).

Comarostaphylis ZUCC. Nov. Stirp. II, 24 (1843).

Mairania NECK. Elem. I, 219 (1790).

Zerobotrys NUTT. Trans. Phil. Soc. 2, VIII, 267 (1843).

Daphnidostaphylis KLOTZSCH, Linn XXIV, 78 (1850).

Xylococcus NUTT. Trans. Am. Phil. Soc. l. c. 258 (1843).

Benth. and Hook., *Gen. Pl.* II, 581; Durand, *Ind. Gen.* 242; Engler and Prantl, *Nat. Pflanz.* 4, I, 48; Schenck, *Palaeophyt.* 721; Baillon, *Hist. Pl.* IX, 191.

Living species: 18; North America, boreal regions principally; 1 sp. around N. hemisphere. California, 12; Canada, 4; E. Sts., 2.

Fossil species: *A. uva-ursi* in diluvial rocks of Europe, Bovey Tracy.

Arctostaphylos uva-ursi (LINN.) SPRENG. Syst. II, 287 (1825).

Arbutus uva-ursi LINN Spec. (1753).

Arctostaphylos officinalis WIMMER, Fl. Sib. 2 (1829).

Daphnidostaphylis fendleriana KLOTZSCH, Linn. XXIV, 81 (1850).

Wats. and Coult., Gray's Man. 6 ed. 315; Britt., Fl. N. J. 159; Mac., Fl. Can. I, 295; Upham, Fl. Minn. 93; Coult., Fl. Colo. 228; Brew. and Wats., Fl. Calif. I, 453; Nym., Fl. Eur.; Hook., Fl. Gt. Brit. 251; Miyabe, Fl. Kur. 247; Led., Fl. Ross. II, 909; Herd., Fl. Eur. Russ. 82; Wats., King Exp. 210; Roth., Wheel. Exp. 183; Engl. Drude, Nat. Pflanz. IV, I, 49; Gray, Syn. Fl. II, 1, 27; Hart., Fl. Scand. I, 319; Webb., Appx. Neb. 36.

Circumpolar; Scand. and Shetland to Montenegro and Bosnia; N. Asia to Kamt., Kuriles, Saghalin, Japan and Dahuria.

North America: Greenland and Newf. to Pac. and 64° N. lat.; S. to Calif. in Sierras; S. to N. Mex. in Rockies; E. to Minn., Neb., Mo., N. J.

Minn. valley: N. E. districts; rare; sandy or rocky knolls.

HERB.: *Sandberg* 378, White Rock; *Roberts* 77, Minnesota point; *Roberts* 78, Knife river.

OXYCOCCUS LUDW. ex O. Kuntze (1737).

Schollera ROTH, Tent. Fl. Germ. I, 170 (1788.)

Benth. and Hook., *Gen. Pl.* II, 575; Durand, *Ind. Gen. Phan.* 242;

Engler and Prantl, *Nat. Pflanz.* 4, I, 51 (Drude); O. Kuntze, *Rev. Gen.* II, 384; Schenck, *Palaeophyt.* 718; Baillon, *Hist. Pl.* IX, 183.

Living species: 3; Europe, Asia and N. America. Canada, 2; E. Sts., 3; S. Sts., 2; Japan and Siberia, 1; Europe, 1.

Fossil species: *O. oxycoccus*, Interglacial on the Elbe (Schenck).

***Oxycoccus macrocarpus* (AIT.) PURSH, Fl. Am. 264 (1814)**

Vaccinium macrocarpon AIT. Hort. Kew. II, 13 (1789).

V. oxycoccus var. *oblongifolius* MICHX. Fl. N. Am. I, 234 (1803).

Wats. and Coult., Gray's Man. 6 ed. 314; Mac., Fl. Can. I, 293; Britt., Fl. N. J. 158; Upham, Fl. Minn. 92; Chap., Fl. S. St. 259; Brew. and Wats., Fl. Calif. I, 450; Nym., Fl. Eur.; Miyabe, Fl. Kur. 246?; Engl. Drude, Nat. Pflanz. IV, 1, 51; Gray, Syn. Fl. II, 1, 26 and Suppl. II. 396.

Kuriles? Intro. in Netherlands. Batavia Isl.

North America: Newf., Anticosti, N. S., N. Br. to Thunder bay and Saskatchewan to Mackenzie river and Oregon? S. to N. Eng., N. J. and mts. of N. Car.; W. to Minn.

Minn. valley: Forest district and far N. W. to Glenwood?; peat bogs and tamarack swamps.

HERB.: *Sheldon* 180, Eagle lake, Blue Earth Co.; *Sheldon* 326, near Smith's Mills, Blue Earth Co.; *Ballard* 542, Spring lake, Scott Co.; *Oestlund* 110, Ramsey Co.; *Sandberg* 372, Chisago Co.; *Herb. Sheld.* 1690, Minneapolis.

***Oxycoccus oxycoccus* (LINN.) MACM. Torr. Bull. XIX (1891).**

Vaccinium oxycoccus LINN. Spec. (1753).

Oxycoccus palustris PERS. Syn. 479 (1805).

O. vulgaris PURSH, Fl. Am. 264 (1814).

Wats. and Coult., Gray's Man. 6 ed. 314; Mac., Fl. Can. I, 293, Britt., Fl. N. J. 158; Upham, Fl. Minn. 92; Brew. and Wats., Fl. Calif. I, 450; Led., Fl. Ross. II, 905; Nym., Fl. Eur.; Hook., Fl. Gt. Brit. 250; Miyabe Fl. Kur. 246; Herd., Fl. Eur. Russ. 82; Engl. Drude, Nat. Pflanz. IV, 1, 51; Gray, Syn. Fl. II, 1, 25 and Suppl. II, 396; Hart., Fl. Scand. I, 318.

N. and C. Eur.; Shetland to Turkey; N. Asia to Dahuria, Japan and Kuriles.

North America: Greenland to Alaska; S. to Minn., N. Eng., N. J., Penn. and Puget Sound region.

Minn. valley: N. E. and probably N. W. districts; infrequent; peat bogs and tamarack swamps.

HERB.: *Bailey* 332, Vermilion lake; *Sandberg* 371, Chisago lake.

VACCINIUM LINN. Gen. 313 (1737).

Batodendron, Pirococcus and Metagonia NUTT. Trans. Am. Phil. Soc. 2, VIII. 261-262 (1843).

Cavinium THOU. Gen. Nov. Madagasc. 11 (1806).

Epigynium KLOTZSCH, Linn. XXIV, 49 (1850).

Disterigma KL. l. c. (1850).

Agapetes DUNAL, DC. Prodr. VII, 554 (1839).

Vitis-Idaea TOURN. Inst. 607 (1700).

Benth. and Hook., *Gen. Pl.* II, 573; Durand, *Ind. Gen. Phan.* 242; Engler and Prantl, *Nat. Pflanz.* 4, I, 51; Schenck, *Palaeophyt.* 719; Baillon, *Hist. Pl.* XI, 182.

Living species: 100; N. extra-tropical regions, Madagascar and the Andes mts. Russia, 10; Europe, 3; Russian Europe, 3; Canada, 16-18; E. Sts. 12; Rocky mts., 3; S. Sts., 13; California, 6; Pl. King., 4; Pl. Wheel., 1.

Fossil species: Tertiary, Alaska (*Heer*); Florissant, Colo. (*A. Br.*); Japan (*Nathorst*); Oeningen (*Heer*); Aix (*Saporta*). A large number of remains in 15-20 species. Quaternary, Madeira, Portugal.

Vaccinium corymbosum LINN. var **amoenum** (AIT.) GRAY, Man. 5, ed. 292 (1867).

V. amoenum AIT. Hort. Kew. II, 12 (1789).

? *V. corymbosum* var. *fuscatum* HOOK. Bot. Mag. 3433 (—).

? *V. marianum*, *grandiflorum* and *elongatum* WATS. Dendr. Brit (1825).

Wats. and Coult., Gray's Man. 6 ed. 313; Britt., Fl. N. J. 159; Mac., Fl. Can. I, 290; Chap., Fl. S. St. 260; Upham, Fl. Minn. 93; Mac., Fl. Can. I, 560; Cov., Fl. Ark. 200; Engl. Drude, Nat. Pflanz. IV, 1, 51 spec.; Gray, Syn. Fl. II, 1, 23.

North America: Newf., N. Br. and Ont. to L. Huron; S. to Minn., N. Eng., N. J. and Va.

Minn. valley: Reported from N. W. district; rare or doubtful; swamps.

HERB.: *Sandberg* 376, Tower.

Vaccinium canadense KALM. Rich. in Frankl. Narr. 2 ed. ed. 12 (1825); (*Kalm in Herb. Banks*).

V. album LAM. Enc. Meth. I, 72 (1783) *not Linn.*

Wats. and Coult., Gray's Man. 6 ed. 312; Mac., Fl. Can. I, 290, 560; Upham Fl. Minn. 93; Engl. Drude, Nat. Pflanz. IV, 1, 51; Gray, Syn. Fl. II, 1, 22.

North America: Atl. coast of Can. to Hudson Bay, Rocky mts., Columbia valley and Slave lake; S. to Minn., Ill., Penn. and N. N. Eng.

Minn. valley: N. edge; swamps; rare or doubtful.

HERB.: *Bailey* 141, Vermilion lake; *Sandberg* 375, Chisago Co.

Vaccinium pennsylvanicum LAM. Enc. Meth. I, 72 (1783).

V. myrtilloides MICHX. Fl. N. Am. I, 223 (1803).

V. ramulosum and *humile* WILLD. Enum. Suppl. 20 (1813).

V. tenellum PURSH, Fl. Am. 288 (1814).

V. multiflorum WATS. Dend. Brit. 125 (1825).

Wats. and Coult., Gray's Man. 6 ed. 312; Mac., Fl. Can. I, 290; Britt., Fl. N. J. 159; Upham, Fl. Minn. 93; Wats., King Exp. 209; Engl. Drude, Nat. Pflanz. IV, 1, 51; Gray, Syn. Fl. II, 1, 22.

North America: Newf. to Rocky mts.; S. to Minn., Ill., N. J. and Penn.

Minn. valley: N. W. district; rare; dry hills and woods.

HERB.: *Sandberg* 373, Black Oak, Goodhue Co.; *Sandberg* 374, Moose lake; *Bailey* 178, Vermilion lake; *Bailey* 453, Mud lake.

Vaccinium stamineum LINN. Spec. 498 (1753).

V. album PURSH, Fl. Am. 28 (1814).

V. elevatum DUNAL, DC. Prodr. VII, 566 (1839).

Picrococcus elevatus and *floridanus* NUTT. Trans. Am. Phil. Soc. l. c. VIII, 260 (1843).

Vaccinium kunthianum KLOTZSCH, (1850?).

Wats. and Coult., Gray's Man. 6 ed. 312; Britt., Fl. N. J. 158; Chap., Fl. S. St. 259; Mac., Fl. Can. I, 290; Upham, Fl. Minn. 93; Cov., Fl. Ark. 200; Engl. Drude, Nat. Pflanz. IV, 1, 51; Gray, Syn. Fl. II, 1, 21.

North America: St. Lawrence and Niagara rivers to Minn.; S. to N. Eng., N. J., Fla. and La.; W. to Ark.

Minn. valley: Reported from N. E. district; rare or doubtful; no Minn. specimens seen.

LXXXIV. PRIMULACEAE. Primrose Family.

Endlicher, *Gen. Pl.* 729 (1836-40); Bentham and Hooker, *Gen. Pl.* II, 628 (1876); Pax, in *Engler and Prantl, Nat. Pflanz.* IV, 1, 98 (1889); Baillon, *Hist. Pl.* XI, 305 (1892).

Genera: 27; cosmopolitan; principally in N. hemisphere.

Species: 350 ± living; a few doubtful fossils in Quaternary.

ANDROSACE LINN. Gen. 111 (1737).

Aretia LINN. Gen. ed. V, 178 (1754).

Benth. and Hook., *Gen. Pl.* II, 632; Durand, *Ind. Gen. Phan.* 249; Engler and Prantl, *Nat. Pflanz.* 4, I, 110 (Pax); O. Kuntze, *Rev. Gen. Pl.* II, 398 (*sub Primula*); Baillon, *Hist. Pl.* XI, 338.

Living species: 62 ±; temperate and Alpine regions, N. hemisphere. Russia, 15; N. America, 5; Canada, 3; Rocky mts., 4; E. Sts., 1; Pac. coast; 2; Pl. King, 2; Pl. Wheel., 1.

Androsace occidentalis PURSH, Fl. Am. 137 (1814).

Primula occidentalis OK. Rev. Gen. II, 400 (1891).

Aretia occidentalis MACM. MSS. (1891).

Wats. and Coult., Gray's Man. 6 ed. 329; Webb., Fl. Neb. 133; Mac., Fl. Can. I, 311; Upham, Fl. Minn. 96; Coult., Fl. Colo. 234; Wats., King

Exp. 213; Cov., Fl. Ark. 201; Engl. Pax, Nat. Pflanz. 4, I, 110; Gray, Syn. Fl. II, 1, 60.

North America: Rainy river to Pembina mts. and Thompson river, Brit. Col.; lat. 49° N. to N. Mex.; E. to Minn., Ill. and Tenn.?; W. to Neb., Utah and Colo.

Minn. valley: S. C. and S. W. districts; high prairies or knolls.

HERB.: *Sandberg 389, Red Wing.*

LYSIMACHIA LINN. Gen. 121 (1737).

Lubinia VENT. Cels. 96 (1800).

Palladia MOENCH, Meth. 429 (1794).

Coxia ENDL. Gen. 733 (1840).

Naumbergia MOENCH, Suppl. 429 (1802).

Thyrsanthus SCHRANK, Denksch. Baier. Acad. 75 (1813).

Lerouxia MERAT. Fl. Par. 77 (1812).

Ephemerum REICH. Fl. Germ. Exs. 409 (1830).

Theopyxis GRISEB. Phillip. and Lechl. (1844).

Godinella LESTIB. ex Dur. Ind. Phan. 250 (1888).

Anagzanthe and **Bernardina** BANDO, ex Baill. l. c. (1892).

Benth. and Hook., *Gen. Pl.* II, 635; Durand, *Ind. Gen. Phan.* 250; Engler and Prantl, *Nat. Pflanz.* 4, I, 112 (Pax); Schenck, *Palaeophyt.* 734; Baillon, *Hist. Pl.* IX, 343.

Living species: 60±; temperate and subtropical regions of both hemispheres; very few in the S. hemisphere; centers in China. N. America, 5.

Fossil species: Interglacial, Elbe river (*Schenck*).

Lysimachia thyrsiflora LINN. Fl. Dan. 517 (1757).

L. capitata PURSH, Fl. Am. 135 (1814).

Naumburgia thyrsiflora REICH. DC. Prodr. VIII, 60 (1844).

Wats. and Coult., Gray's Man. 6 ed. 331; Britt., Fl. N. J. 165; Upham, Fl. Minn. 97; Mac., Fl. Can. I, 314; Gray, Syn. Fl. II, 1, 63; Webb., Appx. Neb. 36.

Europe; Japan.

North America: N. S., N. Br. to Mackenzie and Pac. to Alaska; S. Oregon, Minn., Iowa, Neb., S. Ill., Penn. and N. J.

Minn. valley: Throughout; swamps, bogs and wet meadows.

HERB.: *Sheldon 344*, marshes south of Lake Madison; *Taylor 443*, Lake Helena, Waseca Co.; *Ballard 561*, Prior's lake, Scott Co.; *Taylor 48*, Elysian; *Holzinger 140*, Winona Co.; *Herrick 189*, Minneapolis; *Bailey 421*, Long lake; *Sandberg 391*, Chisago Co.; *Herrick 190*, Minneapolis; *Oestlund 111*, Ramsey Co.; *Herb. Moyer 159*, Montevideo.

Lysimachia terrestris (LINN.) B. S. P. Cat. N. Y. (1888).*Viscum terrestris* LINN. Spec. 1023 (1753).*Lysimachia vulgaris* WALT. Fl. Car. 92 (1788).*L. stricta* AIT. Hort. Kew. I, 199 (1789).*L. racemosa* MICHX. Fl. N. Am. I, 128 (1803).

Wats. and Coult., Gray's Man. 6 ed. 331; Upham, Fl. Minn. 97; Britt., Fl. N. J. 165; Mac., Fl. Can. I, 314; Chap., Fl. S. St. 280; Gray, Syn. Fl. II, 1, 63.

North America: Newf., Anticosti, N. S., N. Br. to Thunder bay and Saskatchewan; S. to N. J. and N. Ga.; W. to Minn. and Ark.

Minn. valley: N. E. and N. W. districts; low meadows; rare.

HERB.: *Holzinger* 141, Winona Co.; *Bailey* 11, Vermilion lake; *Ankeny* 4, Stillwater; *Roberts* 90, Little Marais; *Bailey* 463, Agate bay; *Roberts* 91, Grand Marais; *Sandberg* 392 Red Wing.

STEIRONEMA RAF. Ann. Phys. Brux. VII, 192 (1820).

Durand, *Ind. Gen. Phan.* 250; Engler and Prantl, *Nat. Pflanz.* 4, I, 113 (Pax); Baillon, *Hist. Pl.* XI, 343.

Living species: 4; N. America; 1 introduced in Europe; Pl. Wheel., 2; Pl. King, 1.

Steironema quadriflorum (SIMS) HITCHCOCK, Fl. Ames. 506 (1891).*Lysimachia quadriflora* SIMS, Bot. Mag. 660 (1803).*L. longifolia* PURSH, Fl. Am. 135 (1814).*L. revoluta* NUTT. Gen. I, 122 (1818).*Steironema longifolia* RAF. Ann. Brux. VII, 192 (1820).*Lysimachia angustifolia* GRAY, Man. ed. 1, (1848).

Wats. and Coult., Gray's Man. 6 ed. 330; Chap., Fl. S. St. 281; Upham, Fl. Minn. 97; Mac., Fl. Can. I, 314; Gray, Syn. Fl. II, 1, 62.

North America: Niagara river to S. Man.; S. to N. Y. and W. Va.; W. to Minn. and Iowa.

Minn. valley: Throughout; moist places, especially around prairie sloughs.

HERB.: *Kassube* 158, Minneapolis; *Sheldon* 1328, Lake Benton; *Herrick* 194, Minneapolis; *Herrick* 195, Minneapolis; *Oestlund* 112, Hennepin Co.; *Sandberg* 395, Cannon Falls; *Oestlund* 113, Minneapolis; *Sheldon* 1628, Taylor's Falls; *Herb. Sheld.* 1736, Minneapolis.

Steironema lanceolatum (WALT.) GRAY, var. **hybridum** (MICHX.) GRAY, Proc. Am. Acad. XII, 62 (1876).*Lysimachia hybrida* MICHX. Fl. N. Am. I, 126 (1803).

Wats. and Coult., Gray's Man. 6 ed. 330; Upham, Fl. Minn. 97; Britt., Fl. N. J. 165; Webb., Fl. Neb. (*spec.*) 133; Mac., Fl. Can. I, 313; Coult., Fl.

Colo. 235; Roth., Wheel. Exp. (*spec.*) 185; Cov., Fl. Ark. 201; Gray, Syn. Fl. II, 1, 61.

North America: Ont. to Minn. and Dak.; S. to N. Y., N. J. and Fla.; W. to Neb., Ark., La. and Tex.

Minn. valley: Reported from E. district; infrequent; wet meadows or edges of marshes.

HERB.: *Sandberg 394*, Red Wing.

Steironema ciliatum (LINN.) RAF. Ann. Gen. Phys. Brux VII, 192 (1820).

Lysimachia ciliata LINN. Mant. (1767).

L. quadrifolia var. — LINN. Mant. (1767).

Wats. and Coult., Gray's Man. 6 ed. 330; Upham, Fl. Minn. 97; Britt., Fl. N. J. 165; Chap., Fl. S. St. 280; Mac., Fl. Can. I, 313; Webb., Fl. Neb. 133; Coult., Fl. Colo. 235; Wats., King Exp. 213; Roth., Wheel. Exp. 185; Cov., Fl. Ark. 201; Engl. Pax, Nat. Pflanz. IV, 1, 113; Gray, Syn. Fl. II, 1, 61; Coult., Fl. Tex. 255.

Northern and W. Europe—naturalised.

North America: N. S. and N. Br. to Pac.; S. in Rockies to N. Mex.; E. to Minn., Neb., Mo., Ark., N. Eng., N. J. and Fla.

Minn. Valley: Throughout; low places and edges of swamps or marshes.

HERB.: *Ballard 569*, Prior's lake, Scott Co.; *Taylor 848*, Glenwood; *Sheldon 726*, Sleepy Eye; *Kassube 157*, Minneapolis; *Arthur 71*, Vermilion lake; *Sandberg 393*, Red Wing; *Herrick 191*, St. Louis river; *Herrick 192*, Minneapolis; *Holzinger 142*, Winona Co.; *Herrick 193*, Minneapolis; *Roberts 92*, Duluth; *Herb. Sheld. 1737*; *Herb. Moyer 160, 161*, Montevideo.

TRIENTALIS LINN. Gen. 309 (1737).

Benth. and Hook., *Gen. Pl.* II, 636; Durand, *Ind. Gen. Phan.* 250; Engler and Prantl, *Nat. Pflanz.* 4, I, 113 (Pax); Baillon, *Hist. Pl.* XI, 344.

Living species: 2; 1 in N. Europe, Siberia and N. W. America; 1 in Atlantic and Northern America.

Trientalis americana (PERS.) PURSH, Bart. Fl. Am. Sept. II, 47 (1822).

T. europaea MICHX. Fl. N. Am. I (1803)

T. europaea var. *americana* PERS. Syn. I (1805).

T. europaea var. *angustifolia* TORR. Fl. N. Y. I 363 (1843).

Wats. and Coult., Gray's Man. 6 ed. 329; Britt., Fl. N. J. 165; Upham, Fl. Minn. 97; Mac., Fl. Can. I, 313; Engl. Pax, Nat. Pflanz. IV, I, 113; Gray, Syn. Fl. II, 1, 61.

North America: Newf., Labrador, Anticosti and N. S. to Man. and Saskatchewan; S. to N. J., Va., Ind. and Minn.

Minn. valley: Forest district to Blue Earth Co.; damp woods and peat bogs.

HERB.: *Sheldon* 229, Lake Washington, Blue Earth Co.; *Roberts* 58, Grand Marais; *Roberts* 89, Duluth; *Bailey* 244, Vermilion lake; *Sandberg* 390, Chisago Co.

CENTUNCULUS LINN. Gen. 76 (1737).

Micropyxis DUBY, Mem. Prim. 39 (1844).

Benth. and Hook., *Gen. Pl.* II, 637; Durand, *Ind. Gen. Phan.* 250; Engler and Prantl, *Nat. Pflanz.* 4, I, 115; Baillon, *Hist. Pl.* XI, 345.

Living species; 3; temperate and warmer regions. N. America, 2; S. Sts., 2; Canada, 1.

Centunculus minimus LINN. Spec. (1753).

C. lanceolatus MICHX. Fl. I, 93 (1803).

Wats. and Coult., Gray's Man. 6 ed. 332; Mac., Fl. Can. I, 315; Chap., Fl. S. St. 281; Coult., Fl. Colo. 232; Brew. and Wats., Fl. Calif. I, 469; Upham, Fl. Minn. 97; Nym., Fl. Eur.; Led., Fl. Ross. III, 30; Hook., Fl. Gt. Brit. 265; Herd., Fl. Eur. Russ. 86; Cov., Fl. Ark. 201; Engl. Pax, Nat. Pflanz. IV, 1, 115; Gray, Syn. Fl. II, 1, 64; Hart., Fl. Scand. I, 127; Webb., Appx. Neb. 36; Coult., Fl. Tex. 256.

Europe and N. Asia; Belgium to Montenegro and Baikal Sib.; Australia; Brazil; Andes mts. to Chile in S. Amer.

North America. Minn., Neb. and Dak. to Saskatchewan and Oregon; S. to Minn., Ill., Ark., Tex. and E. to N. Car. and Fla.

Minn. valley: Reported from S. W. edge; probably sparingly S. and W. and N. W.; low places and around bases of rock-ledges.

LXXXV. OLEACEAE. Ash Family.

Endlicher, *Gen. Pl.* 571; Endlicher, *Gen. Pl.* 570 (1836-40)—*Jasmineae*; Benth. and Hooker, *Gen. Pl.* II, 672 (1876); Baillon, *Hist. Pl.* XI, 230 (1892).

Genera: 18; temperate and warmer regions; absent in boreal regions.

Species: 300±; 30± fossil in Tertiary.

FRAXINUS LINN. Gen. 773 (1737).

Ornus PERS. Syn. I, 9 (1805).

Benth. and Hook., *Gen. Pl.* II, 676; Durand, *Ind. Gen. Phan.* 259; Schenck, *Palaeophyt.* 760; Baillon, *Hist. Pl.* XI, 251; Engl. Knoblauch, *Nat. Pflanz.* IV, 2, 5.

Living species: 39±; temperate and subtropical regions. N. America, 12; Europe, 6; Russia, 3; Russian Europe, 2; Canada, 6; E. Sts., 6; S. Sts., 5; Pl. Wheel., 4; California, 2; W. Tex., 6; Rocky mts., 2; Pl. King, 2; especially N. America, E. Asia and Mediterranean region (*Knoblauch*).

Fossil species: Lower Oligocene and Miocene, Europe (*Saporta*, *Heer*); Greenland (*Heer*); Pac. N. America (*Lesquer-*

caur); Pliocene, France (*Saporta, Unger*). Several (10–15) sp. described.

***Fraxinus sambucifolia* LAM.** Enc. Meth. II, 549 (1786).

F. nigra MARSH. Arbust. Amer. 51 (1785).

Wats. and Coult., Gray's Man. 6 ed. 336; Upham, Fl. Minn. 115; Mac., Fl. Can. I, 317; Britt., Fl. N. J. 167; Cov., Fl. Ark. 202; Gray, Syn. Fl. II, 1, 76.

North America: Anticosti to L. Superior reg., Man. and Saskatchewan; S. to Minn., Mo. and Ark.; E. to N. Eng., N. J., Va. and Ky.

Minn. valley: Reported from N. and N. W. districts; rich woods and banks or shores.

HERB.: *Bailey* 346, St. Louis river.

***Fraxinus pubescens* LAM.** Enc. Meth. II, 548 (1786).

F. nigra DU ROI, Diss. (1771).

F. pennsylvanica MARSH. Arbust. Amer. 51 (1785).

F. tomentosa MICHX. f. Sylva, 119 (1810).

F. oblongocarpa BUCKL. Proc. Acad. Phil. (1862).

Wats. and Coult., Gray's Man. 6 ed. 336; Britt., Fl. N. J. 167; Coult., Fl. Colo. 236; Mac., Fl. Can. I, 316; Upham, Fl. Minn. 115; Webb., Fl. Neb. 140; Chap., Fl. S. St. 370; Gray, Syn. Fl. II, 1, 75; Engl. Knobl., Nat. Pflanz. IV, 2, 7; Coult., Fl. Tex. 259.

North America: N. S., Q., Ont. to Man. and Saskatchewan, and 53° N. lat.; S. to Minn., Dak., Neb., Ill., Ohio and E. U. S. to Fla. Tex.?

Minn. valley: N. E. district; local or rare; rich woods and banks of lakes or streams.

HERB.: *Bailey* 56 and 58, Vermilion lake.

***Fraxinus viridis* MICHX. f.** Sylv. 120 (1810).

F. juglandifolia WILLD. Spec. IV, 1104 (1805).

F. concolor MUHL. Cat. (1813).

F. caroliniana PURSH, Fl. Am. I, 9 (1814).

Wats. and Coult., Gray's Man. 6 ed. 336; Britt., Fl. N. J. 167; Upham, Fl. Minn., 115; Webb., Fl. Neb. 140; Chap., Fl. S. St. 370; Mac., Fl. Can. I, 316; Coult., Fl. Colo. 236; Roth., Wheel. Exp. 185; Wats., King Exp. 284; Cov., Fl. Ark. 202; Gray, Syn. Fl. II, 1, 75; Coult., Fl. Tex. 259.

North America: Owen Sound to Man. and Assiniboia; S. to Dak., Neb., Ark., Tex., and E. to N. Eng., N. J. and Fla.

Minn. valley: Throughout to Pommes des Terres and Cottonwood valleys; rich woods and shores or banks.

HERB.: *Taylor* 14, Elysian; ? *Taylor* 663, Cobb river, Blue Earth Co.; *Menzel* 6, Pipestone.

***Fraxinus americana* LINN.** Spec. 2 ed. 1510 (1762).

F. alba MARSH. Arbust. Amer. 51 (1785).

F. acuminata LAM. Enc. Meth. II, 542 (1786).

F. canadensis GAERTN. Fruct. I, 122 (1788).

F. epiptera MICHX. Fl. N. Am. II, 256 (1803).

F. discolor MUHL. Cat. 111 (1813).

Wats. and Coult., Gray's Man. 6 ed. 335; Mac., Fl. Can. I, 316; Upham, Fl. Minn. 115; Webb., Fl. Neb. 140; Chap., Fl. S. St. 369; Britt., Fl. N. J. 167; Cov., Fl. Ark. 202; Gray, Syn. Fl. II, 1, 74; Engl. Knobl., Nat. Pflanz. IV, 2, 7; Coult., Fl. Tex. 259 *in var.*

North America: N. S., N. Br. to Owen Sound and Minn.; S. to Neb., Kan. and Ark.; E. to N. Eng., N. J., Fla. and La. Var. in Tex.

Minn. valley: Throughout; rich woods and banks of lakes and streams.

HERB.: *Taylor* 484, Janesville; *Taylor* 704, Minnesota lake; *Taylor* 816, Glenwood; *Taylor* 526, Mud lake, Waseca Co.; *Ballard* 550, Spring lake, Scott Co.; *Sheldon* 855, Sleepy Eye; *Taylor* 1020, Glenwood; *Bailey* 117, Vermilion lake; *Oestlund* 152, Hennepin Co.; *Holzinger* 192, Winona Co.; *Herb. Sheld.* 1907, Minneapolis.

LXXXVI. GENTIANACEAE. Gentian Family.

Endlicher, *Gen. Pl.* 599 (1836-40); Bentham and Hooker, *Gen. Plant.* II, 799 (1876); Baillon, *Hist. Pl.* X, 113 (1891).

Genera: 45; temperate regions; a few in tropics and boreal regions.

Species: 550-600; widely distributed; a few fossil forms from Tertiary rocks.

MENYANTHES LINN. Gen. 117 (1737) em. BENTH. l. c. (1876).

Menonanthos HALL. Fl. Helv. 633 (1742).

Baillon, *Hist. Pl.* X, 144; Benth. and Hook., *Gen. Pl.* II, 819; Durand, *Ind. Gen. Phan.* 278; Schenck, *Palaeophyt.* 763.

Living species: 2; Europe; Asia—mts. and N.; N. America. 1, Europe, Asia, N. America; 1, W. N. Amer. and Russia. N. Amer., 2.

Fossil species: 2; Tertiary, Greenland, Lausanne, etc. (*Heer*); doubtful.

Menyanthes trifoliata LINN. Spec. 207 (1753).

Wats. and Coult., Gray's Man. 6 ed. 353; Mac., Fl. Can. I, 327; Britt., Fl. N. J. 173; Upham, Fl. Minn. 113; Brew. and Wats., Fl. Calif. I, 485. Nym., Fl. Eur.; Led., Fl. Ross. III, 76; Hook., Fl. Gt. Brit. 273; Miyabe, Fl. Kur. 251; Herd., Fl. Eur. Russ. 88; Wats., King. Exp. 281; Gray, Syn. Fl. II, 1, 128; Hart., Fl. Scand. I, 102; Webb., Appx. Neb. 40.

Iceland and N. Russia to Spain and Servia; Siberia to N. W. India, Japan and Kurile Isls.

North America: Greenland and Labrador to Mackenzie and Alaska; S. to N. S., N. Br., N. Y., N. J. and Penn.; W. to Minn., Dak., Iowa and Neb.; S. in mts. to San Francisco and Nevada.

Minn. valley: Forest district and probably to Chipewa river valley; tamarack swamps and wet woods.

HERB.: *Ballard* 357, Helena, Scott Co.; *Ballard* 659, Waconia; *Taylor* 210, Janesville; *Sheldon* 122, Madison Lake; *Taylor* 177, Janesville; *Bailey* 282, St. Louis river; *Kassube* 201, Minneapolis; *Sandberg* 464, Chisago lake; *Sandberg* 465, Red Wing; *Herb. Sheld.* 1776, Ramsey Co.

NYMPHODES LUDW. Defin. 23 (1737).

Limnanthemum GMEL. Nov. Act. Petrop. XIV, 527 (1769).

Waldschmidtia WIGG. Prim. Holst. 19 (1780).

Villarsia GMEL. Act. Petrop. XV (1791) *not Vent.*

Schweyckerta C. C. GMEL. Fl. Bad. I, 447 (1805).

Baillon, *Hist. Pl.* X, 144; Benth. and Hook., *Gen. Pl.* II, 819; Durand, *Ind. Gen. Phan.* 278; O. Kuntze, *Rev. Gen.* II, 429.

Living species: 26 described; 12 reduced; temperate and tropical regions. N. America, 2; S. Sts., 2; 1 other regions except W. of Rocky mts. W. Tex., 1.

Nymphodes lacunosum (VENT.) OK. *Rev. Gen.* II, 429 (1891).

Villarsia lacunosa (VENT.) Choix. 9 (1803).

? *Limnanthemum lacunosum* MICHX. Fl. N. Am. I (1803)

Villarsia cordata ELL. Sk. I, 230 (1821).

Wats. and Coult., Gray's Man. 6 ed. 353; Britt., Fl. N. J. 174; Upham, Fl. Minn. 113; Mac., Fl. Can. I, 327; Chap., Fl. S. St. 358; Cov., Fl. Ark. 204; Gray, Syn. Fl. II, 1, 128.

North America: N. S., N. Br., Ont. to Minn.; S. to N. Eng., N. J., Fla.; W. to Ark., La. and Miss.

Minn. valley: Reported from N. edge; rare; floating in quiet streams or lakes.

GENTIANA LINN. Gen. 197 (1737).

Pneumonanth and **Hippion** SCHMIDT, Roem. Arch. I, 8 (1796).

Ciminalis ADANS. FAM. II, 504 (1763).

Asterias, **Coelantha**, **Dasystephana**, **Ericoila**, **Eurythalia** and **Gentianella** BORKH. Roem. Arch. I, 23 (1796).

Ericala DON, Trans. Linn. Soc. XVII, 511 (1837).

Glyphospermum, **Selatum**, **Ulostoma** and **Eudoxia** G. DON, Gen. Syst. IV, 195, 196 (1838).

Varasia PHILLIPPI, Fl. Atacam. 35, t. 5 (1860).

Baillon, *Hist. Pl.* X, 140; Benth. and Hook., *Gen. Pl.* II, 815; Durand, *Ind. Gen. Phan.* 278.

Living species: 180; cosmopolitan; in tropical mts. Europe, 35; Russia, 45; Russian Europe, 16; North America, 38; Rocky mts., 14; S. Sts., 7; E. Sts., 12; Canada, 27; California and Oregon, 10-12; Pl. King., 6; Pl. Wheel., 10.

***Gentiana linearis* FROEL. var. *rubricaulis* (SCHWEIN.).**

Gentiana rubricaulis SCHWEIN. Keat. Narr. Appx. 110 (1825).

G. saponaria var. *linearis* GRAY, Man. ed. V. 389 (1867) *part.*

G. linearis var. *lanceolata* GRAY, Syn. Fl. II, 1, 123 (1886).

G. pneumonanthe AUCT. AMER.

Wats. and Coult., Gray's Man. 6 ed. 351; Britt., Fl. N. J. 183; Mac., Fl. Kan. I. 325, 566; Upham, Fl. Minn. 113.

North America: N. Br., Q., Ont., L. Huron reg., L. Superior reg. and Minn.; S. to N. Eng., N. J., N. Y. and mts. of Md.; W. to Ill. and Wisc.

Minn. valley: Reported from S. Central district; wet prairies.

***Gentiana flavida* GRAY, Am. Jour. Sci. N. Ser. I, 80 (1846).**

G. alba AUCT. *not* MUHL.

Wats. and Coult., Gray's Man. 6 ed. 351; Upham, Fl. Minn. 112; Mac., Fl. Can. I, 324; Gray, Syn. Fl. II, 1, 123; Webb., Appx. Neb. 40.

North America: Ont., N. Y. and Penn. to Va.; W. to Minn., Ill., Neb. and Ky.

Minn. valley: Forest district to New Ulm; rare or local; wet meadows.

HERB.: *Sandberg* 462, Red Wing; *Holtz* 5, Cedar lake.

***Gentiana andrewsii* GRISEB. Gent. 287 (1839).**

Gentiana andrewsii var. *linearis* HOOK. Fl. Bor.-Am. II, 55 (1840).

Wats. and Coult., Gray's Man. 6 ed. 351; Britt., Fl. N. J. 172; Mac., Fl. Can. I, 324, 566; Upham, Fl. Minn. 113; Chap., Fl. S. St. 356; Cov., Fl. Ark. 204; Gray, Syn. Fl. II, 1, 123.

North America: Q., Ont. to Thunder bay; S. to N. Eng., N. J. and N. Ga.; W. to Minn. and Ark.

Minn. valley: Throughout; wet meadows and banks of lakes and streams.

HERB.: *Sheldon* 1457, Pipestone; *Sheldon* 1300, Lake Benton; *Oestlund* 148, Minneapolis; *Kassube* 200, Minneapolis; *Bailey* 355, Mud River; *Sandberg* 463, Cannon Falls; *Herb. Sheld.* 1873, Ramsey Co.; *Herb. Wickersheim* 106, 107, Idlewild, Lincoln Co.; *Herb. Moyer* 198, Montevideo.

***Gentiana saponaria* LINN. Spec. 228 (1753).**

G. catesbaei WALT. Fl. Car. 109 (1788).

G. elliottii var. (?) *latifolia* CHAPM. Fl. S. St. 356 (1860).

Wats. and Coult., Gray's Man. 6 ed. 350; Britt., Fl. N. J. 172; Upham, Fl. Minn. 113; Chap., Fl. S. St. 356; Mac., Fl. Can. I, 324; Cov., Fl. Ark. 204; Gray, Syn. Fl. II, 1, 122.

North America: Q., Ont. and N. Y. to N. J. and Fla.; W. to Minn., Ark. and La.

Minn. valley: E edge; moist woodland and river banks or lake shores.

HERB.: *Holzinger* 186, Fillmore Co.

***Gentiana puberula* MICHX.** Fl. N. Am. I, 176 (1803).

G. saponaria var. *puberula* GRAY, Man. ed. 1, 360 (1848).

Wats. and Coult., Gray's Man. 6 ed. 350; Upham, Fl. Minn. 113; Mac., Fl. Can. I, 324, 566; Webb., Fl. Neb. 140; Cov., Fl. Ark. 204; Gray, Syn. Fl. II, 1, 122.

North America: Red river valley to W. N. Y.; S. to Ohio, Ky., Kan. and Ark.; W. to Minn. and Neb.

Minn. valley: Throughout; dry prairies and barren places.

HERB.: *Taylor* 1178, Glenwood; *Manning* 6, Lake City; *Herb. Wickersheim* 108, Idlewild, Lincoln Co.; *Herb. Moyer* 199, Montevideo.

***Gentiana quinquefolia* LINN. var. *occidentalis* (GRAY) HITCHCOCK,** Fl. Ames. 508 (1891).

spec. *G. quinqueflora* LAM. Enc. Meth. II, 643 (1786).

G. amarelloides PURSH, Fl. Am. 186 (1814).

var. *G. quinqueflora* HOOK. Bot. Mag. 3496 (—) chiefly.

G. quinqueflora var. *occidentalis* GRAY, Man. 1 ed. 359 (1848).

Wats. and Coult., Gray's Man. 6 ed. 350; Upham, Fl. Minn. 112; Britt., Fl. N. J. 172 spec.; Chap., Fl. S. St. 355; Mac., Fl. Can. I, 566; Gray, Syn. Fl. II, 1, 119.

North America: Ont. to Va. and Ohio; W. to Minn.; S. to Tenn., Fla. and La.

Minn. valley: Reported from E. district; probably throughout forest district; knolls in woods.

HERB.: *Sandberg* 460, Red Wing.

***Gentiana serrata* GUNN.** Fl. Norv. 10 (1766).

G. detonsa ROTTB. Hort. Hafn. X, 254 (1773).

G. barbata FROEL. Gent. 114 (1796).

G. brachypetala BUNGE, Consp. Gent. 225 (1829).

Wats. and Coult., Gray's Man. 6 ed. 349; Upham, Fl. Minn. 112; Mac., Fl. Can. I, 321; Brew. and Wats., Fl. Calif. I, 481; Coult., Fl. Colo. 243; Forbes and Hems., Fl. Sin. II, 127; Herd., Fl. Eur. Russ. 88; Roth., Wheel. Exp. 193; Gray, Syn. Fl. II, 1, 117; Hart, Fl. Scand. I, 99.

Scandinavia to N. India, Manchuria and China.

North America: Newf. and Anticosti to Saskatchewan, Rocky mts., N. W. T., Point Barrow, Alaska and Arctic ocean; S. in Sierras to Mariposa Co., Calif.; S. in Rockies to Colo. and Nev.; S. to Minn., Dak., Iowa and E. to N. Y.

Minn. valley: Forest district and N. W. district; wet meadows.

HERB.: *Taylor* 1013, Glenwood; *Oestlund* 147, Minneapolis; *Leiberg* 53, Blue Earth Co.; *Herb. Sheld.* 1874, Minneapolis.

***Gentiana americana* (LINN.).**

G. ciliata americana LINN. Syst. I, 645 (1756).

G. crinita FROEL. Gent. 112 (1796).

G. fimbriata ANDR. Bot. Rep. 509 (1797-1804).

Gentianella crinita DON, Syst. IV, 179 (1838).

Wats. and Coult., Gray's Man. 6 ed. 349; Britt. Fl. N. J. 172; Mac., Fl. Can. I, 321; Chap., Fl. S. St. 355; Upham, Fl. Minn. 112; Wats., King Exp. 278; Roth., Wheel. Exp. 193; Gray, Syn. Fl. II, 1, 117.

North America. Q., Ont. to Saskatchewan and 52° N. lat.; S. to N. Eng., N. J. and mts. of Ga.; W. to Gt. lakes, Minn., Dak. and Colo.

Minn valley: Throughout forest district; swampy places and wet meadows.

HERB.: *Holzinger* 185, Winona Co.; *Sandberg* 461, Cannon Falls; *Hammond* 33, Minneapolis.

LXXXVII. APOCYNACEAE. Dogbane Family.

Endlicher, *Gen. Pl.* 577 (1836-40); Bentham and Hooker, *Gen. Plant.* II, 681 (1876); Baillon, *Hist. Pl.* X, 146 (1891).

Genera: 127 (Baillon); 103 (B. and H.); tropical regions; a few in temperate zones of N. and S. hemispheres.

Species: 1000±; very few in S. hemisphere; a few fossil from Tertiary, *Apocynophyllum*?

APOCYNUM LINN. Gen. 187 (1737).

Baillon, *Hist. Pl.* X, 207; Benth. and Hook., *Gen. Pl.* II, 716; Durand, *Ind. Gen. Phan.* 264; Schenck, *Palaeophyt.* 767.

Living species: 5; S. Europe; temperate Asia; N. America. Russia, 2; Europe, 1; N. America, 2; Pl. Wheel., 2, Canada, 2; W. Tex., 1-2.

Fossil species: *Apocynophyllum*; Tertiary, Portugal, Japan, Australia, East Indies (*Heer, Ettinghausen*), a few species; all rather doubtful.

***Apocynum cannabinum* LINN. Spec. 213 (1753).**

A. sibiricum JACQ. Hort. Vindob. III, 66 (1776).

A. hypericifolium AIT. Hort. Kew. I, 304 (1789).

A. pubescens R. BR. Wern. Soc. I, 67 (1808).

Wats. and Coult., Gray's Man. 6 ed. 338; Britt., Fl. N. J. 168; Webb., Fl. Neb. 140; Chap., Fl. S. St. 358; Upham, Fl. Minn. 114; Mac., Fl. Can. I, 318, 565; Coult., Fl. Colo. 237; Brew. and Wats., Fl. Calif. I, 473; Wats.

King Exp. 282; Roth., Wheel. Exp. 186; Cov., Fl. Ark. 203; Gray, Syn. Fl. II, 1, 83; Coult., Fl. Tex. 262.

North America: Same range as *A. androsaemifolium*; extends also into S. Calif. and E. to Fla.

Minn. valley: Throughout; rich woods, thickets, river banks and shores; edges of marshes.

HERB.: *Taylor* 337, Janesville; *Ballard* 93, Shakopee; *Taylor* 583, Minnesota Lake; *Taylor* 1025, Glenwood; *Sheldon* 1532, Lake Benton; *Ballard* 507, Prior's lake, Scott Co.; *Taylor* 752, Glenwood; *Sheldon* 975, Sleepy Eye; *Sheldon* 388, Madison Lake; *Sheldon* 332, Smith's Mills, Blue Earth Co.; *Herrick* 249, Minneapolis; *Kassube* 203, Minneapolis; *Bailey* 214, Vermilion lake; *Sandberg* 467, Cannon Falls; *Oestlund* 150, Hennepin Co.; *Herrick* 250, Minnetonka; *Herb. Moyer* 201, Chippewa river, near Montevideo.

***Apocynum androsaemifolium* LINN.** Spec. 213 (1753).

A. androsaemifolium and var. *incanum* A. DC. Prodr. VIII, 412 (1844).

Wats. and Coult., Gray's Man. 6 ed. 338; Britt., Fl. N. J. 168; Upham, Fl. Minn. 113; Webb., Fl. Neb. 140; Mac., Fl. Can. I, 317, 565; Coult., Fl. Colo. 237; Chap., Fl. S. St. 359; Brew. and Wats., Fl. Calif. I, 473; Roth., Wheel. Exp. 186; Wats., King Exp. 282; Cov., Fl. Ark. 203; Gray, Syn. Fl. II, 1, 82; Coult., Fl. Tex. 263.

North America: Anticosti and Atl. coast to Pac. and Brit. Col.; S. to N. Eng., N. J. and N. Car.; W. to Sierras and N. Mexico.

Minn. valley: Throughout; rich woods and thickets; banks and shores.

HERB.: *Ballard* 738, Waconia; *Taylor* 989, Glenwood; *Sheldon* 425, Madison Lake; *Ballard* 852, Patterson lake, Carver Co.; *Ballard* 91, Chaska; *Taylor* 328, Janesville; *Herrick* 248, St. Louis river; *Oestlund* 149, Ramsey Co.; *Kassube* 202, Minneapolis; *Bailey* 183, Vermilion lake; *Bailey* 131, Vermilion lake; *Sandberg* 466, Goodhue Co.; *Herb. Sheld.* 1692, Minneapolis; 1731, Ramsey Co.; *Herb. Moyer* 200, Montevideo.

LXXXVIII. ASCLEPIADACEAE. Milkweed Family.

Endlicher, *Gen. Pl.* 588 (1836-40); Bentham and Hooker, *Gen. Plant.* II, 728 (1876); Baillon, *Hist. Pl.* X, 221 (1891).

Genera: 190 (Baillon); 146 (B. and H.); tropical regions; a few in temperate zones, especially in N. hemisphere and S. Africa; in the latter region the development is especially abundant.

Species: 1500 ±; 1-2 fossil in recent rocks.

ASCLEPIAS LINN. Gen. 185 (1737).**Otaria** HBK. Nov. Gen. et Spec. III, 192 (1818).**Gomphocarpus, Xysmalobium, Kanahia** R. BR. Mem. Wern. Soc. I, 37, 38, 39 (1808).**Krebsia, Mackenia** HARV. Gen. S. Afr. Pl. ed. 2, 233 (1868).**Pachycarpus, Parapodium, Schizoglossum, Aspidoglossum, Logarinthus** E. MEY. Comm. Pl. Austr. Afr. 200-221 (1837).**Rhinolobium** ARN. Mag. Zoöl. and Bot. II, 420 (1838).**Canahia** SPRENG. Syst. I, 526 (1825).**Asclepiodora** GRAY, Proc. Am. Acad. XII, 66 (1877).**Anantherix** and **Stylandra** NUTT. Gen. I, 169, 170 (1818).**Polyotus** NUTT. Trans. Am. Phil. Soc. V, 199 (1839).**Podostigma** and **Acerates** ELL. Sk. I, 316, 326 (1821).**Schizonotus** A. GRAY, Syn. Fl. II, 1, 100 (1886).**Funastrum** FOURN. Ann. Sci. Nat. 6, XIV, 388 (1882).Baillon, *Hist. Pl.* X, 245; Benth. and Hook., *Gen. Pl.* I, 752-755; Durand, *Ind. Gen. Phan.* 268; Schenck, *Palaeophyt.* 770.

Living species: 180; cosmopolitan except in polar and sub-polar regions. N. America, 55; S. and E. E. Sts., 28; S. Sts., 30; W. Tex., 21.

Fossil species: Tertiary, Japan (*Unger*); Portugal, Greenland, Rhone, Oenigen (*Heer*); 5 sp. described.**Asclepias lanuginosa** NUTT. Gen. I, 168 (1818).*A. nuttalliana* TORR. Ann. Lyc. N. Y. II, 218 (1834).*Acerates lanuginosa* DECN. DC. Prodr. VIII (1844).*A. monocephala* LAPHAM, Gray's Man. ed. 2, appx. (1852).

Wats. and Coult., Gray's Man. 6 ed. 343; Webb., Fl. Neb. 141; Upham, Fl. Minn. 115; Coult., Fl. Colo. 242.

North America: Mont. to Wisc. and N. Ill.; S. to Neb. and Colo.

Minn. valley: Blue Earth Co. W. to Dakota line; S. Central, S. W. and N. W. districts; prairies and hillsides.

HERB.: *Gedge* 12; Riverton, Clay Co.; *Holzinger* 191, Winona; *Herb. Moyer* 210, Montevideo.**Asclepias viridiflora** RAF. Med. Repos. XI, 360 (1808).*Acerates viridiflora* ELL. Sk. I, 317 (1821).*Polyotus heterophyllus* NUTT. Trans. Am. Phil. Soc. V, 522 (1840).

Wats. and Coult., Gray's Man. 6 ed. 343; Britt., Fl. N. J. 169; Mac., Fl. Can. I, 320; Upham, Fl. Minn. 115; Webb., Fl. Neb. 141; Coult., Fl. Colo. 242; Cov., Fl. Ark. 203; Chap., Fl. S. St. 365; Gray, Syn. Fl. II, 1, 99; Coult., Fl. Tex. 268.

North America: Niagara river to Rocky mts.; S. to N. J. and Fla.; W. to Dak., Neb., Colo., Ark. and Tex.

Minn. valley: Throughout; dry places and banks of streams.

HERB.: Type,—*Sheldon* 1105, Springfield; *Sheldon* 1387, Lake Benton; *Ballard* 383, Jordan, Scott Co.; *Sheldon*

732, Sleepy Eye; *Gedge* 11, Detroit; var. *linearis* (Gray)—*Sandberg* 474, Red Wing; *Holzinger* 190-191, Winona;—var. *lanceolata* (Ives); *Ballard* 272, Jordan, Scott Co.; *Taylor* 690, Minnesota lake; *Sheldon* 610, Wilton, Waseca Co.; *Leiberg* 55, Blue Earth Co.; *Herb. Moyer* 209, Watson [var. *lanceolata* (Ives).].

***Asclepias floridana* LAM.** Enc. Meth. I, 284 (1783).

A. longifolia MICHX. Fl. N. Am. I, 116 (1803).

Acerates longifolia ELL. Sk. I, 317 (1821).

A. floridana HITCHCOCK, Fl. Ames 508 (1891).

Wats. and Coult., Gray's Man. 6 ed. 343; Webb., Fl. Neb. 141; Chap., Fl. S. St. 366; Mac., Fl. Can. I, 565; Cov., Fl. Ark. 203; Gray, Syn. Fl. II, 1, 99, Coult., Fl. Tex. 268.

North America: Ont. to Minn., Dak. and Neb.; S. to Ohio, Fla., Ark. and Tex.

Minn. valley: S. and N. W. districts; wet meadows or fields.

HERB.: *Juni* 13, Alexandria; ?*Gedge* 13, Clay Co.

***Asclepias verticillata* LINN.** Spec. ed. 2, 1272 (1762).

A. galioides HBK. Nov. Gen. et Spec. III, 188 (1818).

Wats. and Coult., Gray's Man. 6 ed. 342; Britt., Fl. N. J. 170; Upham, Fl. Minn. 115; Mac., Fl. Can. I, 319; Chap., Fl. S. St. 365; Coult., Fl. Colo. 241; Roth., Wheel. Exp. 368; Wats., King Exp. 282; Cov., Fl. Ark. 203; Gray, Syn. Fl. II, 1, 97; Coult., Fl. Tex. 267.

North America: Ont. to Saskatchewan and S. Man.; S. to N. Eng., N. J. and Fla.; W. to Minn., Neb., Colo., N. Mex., Tex. and Mexico.

Minn. valley: Throughout except N. E. district; hills and fields.

HERB.: *Sheldon* 970, Sleepy Eye; *Sheldon* 1068, Springfield; *Sheldon* 815, Sigel township, Brown Co.; *Taylor* 925, Glenwood; *Juni* ? 12, Glyndon; *Herb. Moyer* 208, Chippewa Co.

***Asclepias quadrifolia* LINN.** Spec. (1753).

A. vanilla RAF. Am. Mo. Mag. (1818).

Wats. and Coult., Gray's Man. 6 ed. 342; Britt., Fl. N. J. 170; Upham, Fl. Minn. 114; Chap., Fl. S. St. 364; Cov., Fl. Ark. 203; Gray, Syn. Fl. II, 1, 96.

North America: Ont. to N. Eng., N. J. and N. Car.; W. to Minn. and Ark.

Minn. valley: Reported from E. edge; doubtful; no Minn. specimens seen.

***Asclepias ovalifolia* DECN.** DC. Prodr. VIII, 567 (1844).

A. variegata var. *a.* HOOK. Fl. Bor.-Am. II, 252 (1840).

A. nuttalliana GRAY, Man. 2 ed. 352, 704 (1852).

Wats. and Coult., Gray's Man. 6 ed. 342; Webb., Fl. Neb. 141; Mac., Fl. Can. I, 319; Upham, Fl. Minn. 114; Coult., Fl. Colo. 241; Gray, Syn. Fl. II, 1, 95.

North America. Man., Assiniboia and Saskatchewan to Rocky mts.; S. to N. Ill., Wisc., Minn., Iowa, Dak., Neb. and Kan.

Minn. valley: Throughout; most abundant S. W. and W. prairies.

HERB.: *Sheldon* 606, Waseca; *Taylor* 178, Janesville; *Menzel* 4, Pipestone City; *Herrick* 253, Minneapolis; *Ankeny* 5, Stillwater; *Roberts* 109, White Bear; *Kassube* 205, Minneapolis; *Sandberg* 470, Red Wing; *Herb. Moyer* 204, 205, Chippewa Co.; *Herb. Wickersheim* 109, Idlewild, Lincoln Co.

***Asclepias exaltata* (LINN.) MUHL.** Cat. 28 (1813).

A. syriaca var. *exaltata* LINN. Spec. ed. 2, 313 (1762).

A. phytolaccoides PURSH, Fl. Am. 180 (1814).

Wats. and Coult., Gray's Man. 6 ed. 342; Upham, Fl. Minn. 114; Mac., Fl. Can. I, 319; Chap., Fl. S. St. 262; Gray, Syn. Fl. II, 1, 92; Britt., Fl. N. J. 169.

North America: Ont. and N. Eng. to Minn.; S. to N. J. and Ga.; W. to Ark.

Minn. valley: Forest district; moist woods and thickets

HERB.: *Ballard* 471, Prior's lake, Scott Co.; *Sheldon* 617, Waseca; *Sheldon* 617a, Wilton, Waseca Co.; *Ballard* 205, Jordan, Scott Co.; *Herrick* 252, Minneapolis; *Sandberg* 469, Red Wing.

***Asclepias obtusifolia* MICHX.** Fl. N. Am. I, 113 (1803).

A. purpurascens WALT. Fl. Car. 103 (1788).

Wats. and Coult., Gray's Man. 6 ed. 341; Britt., Fl. N. J. 170; Webb., Fl. Neb. 141; Upham, Fl. Minn. 115; Chap., Fl. S. Sts. 364; Coult., Fl. Colo. 239; Cov., Fl. Ark. 203; Gray, Syn. Fl. II, 1, 91 and Syn. Suppl. II, 401; Coult., Fl. Tex. 266.

North America: Minn. and Dak. to Colo., Neb., Ark. and Tex.; E. across continent to N. Eng., N. J., N. Car. and Fla.

Minn. valley: Reported from S. E. edge; doubtful sandy fields or woods.

***Asclepias sullivantii* ENGELM.** Gray Man. 1 ed. 366 (1848).

Wats. and Coult., Gray's Man. 6 ed. 341; Webb., Fl. Neb. 141; Upham, Fl. Minn. 114; Gray, Syn. Fl. II, 1, 91.

North America: Minn. and Dak. to Neb., Kan. and Ohio.

Minn. valley: Forest district and W. to Pommès des Terres, at least; rich woods and banks of streams.

HERB.: *Taylor* 580, Minnesota lake; *MacM* and *Sheld.* 45, Brainerd.

Asclepias syriaca LINN. Spec. ed. 2, 313 (1762).*A. cornuti* DECN. in DC. Prodr. VIII, 564 (1844).

Wats. and Coult., Gray's Man. 6 ed. 341; Britt., Fl. N. J. 169; Webb., Fl. Neb. 141; Chap., Fl. S. St. 362; Mac., Fl. Can. I, 319; Herd., Fl. Eur. Russ. 86; Nym., Fl. Eur.; Gray, Syn. Fl. II, 1, 91 and Syn. Suppl. II, 401.

Russia in Europe; N. Asia.

North America: N. Br., Q., Ont. to Saskatchewan; S. to N. Eng., N. J. and N. Car.; W. to Minn., and Neb.—spreading throughout continent.

Minn. valley: Throughout; rich meadows and edges of thickets or streams.

HERB.: *Ballard* 26m, Chaska; *Taylor* 579, Minnesota lake; *Ballard* 258, Jordan, Scott Co.; *Sheldon* 1552, Lake Benton; *Herrick* 251, Minneapolis; *Kassube* 204, Minneapolis; *Sandberg* 468, Cannon Falls; *Herb. Sheld.* 1697, Minneapolis; *Herb. Moyer* 203, Montevideo.

Asclepias speciosa TORR. Ann. Lyc. N. Y. II, 218 (1834).*A. douglasii* HOOK. Fl. Bor.-Am. II, 53 (1840).

Wats. and Coult., Gray's Man. 6 ed. 341; Webb., Fl. Neb. 141; Upham, Fl. Minn. 114; Brew. and Wats., Fl. Calif. I, 475; Coult., Fl. Colo. 239; Mac., Fl. Can. I, 319; II, 341; Roth., Wheel. Exp. 188; Wats., King Exp. 282; Cov., Fl. Ark. 203; Gray, Syn. Fl. II, 1, 91.

North America: Man. and Assiniboia to Rocky mts., Brit. Col. and Oregon; S. to Yosemite valley; E. to Utah, Ark., Neb., Minn.

Minn. valley: Probably throughout; especially S. and W.; fields and river banks.

HERB.: *Taylor* 727, Wells, Faribault Co.; *Herb. Moyer* 202, Montevideo.

Asclepias incarnata LINN. Spec. ed. 2, 314 (1762).*A. pulchra* WILLD. Spec. I, 1207 (1798).*A. amoena* BRONGN. Ann. Sci. Nat. XXIV, t. 13 (1831).

Wats. and Coult., Gray's Man. 6 ed. 340; Britt., Fl. N. J. 170; Webb., Fl. Neb. 140; Upham, Fl. Minn. 114; Mac., Fl. Can. I, 318; Chap., Fl. S. St. 363; Cov., Fl. Ark. 203; Gray, Syn. Fl. II, 1, 90; Coult., Fl. Tex. 265 *in var.*

North America: N. Br., Q., Ont. to Saskatchewan and S. Man.; S. to N. J., N. Car. and Ga.; W. to Dak., Neb., Ark., La., Tex. *in var.*

Minn. valley: Throughout; edges of swamps and marshes.

HERB.: *Ballard* 853, Patterson lake, Carver Co.; *Taylor* 568, Minnesota lake; *Ballard* 757, Waconia; *Taylor* 777, Glenwood; *Sheldon* 645, Waseca; *Holzinger* 188, Winona Co.; *Sandberg* 471, Goodhue Co.; *Sandberg* 472, Cannon Falls; *Her-*

rick 254, Minneapolis; *Oestlund* 151, Hennepin Co.; *Herb. Moyer* 206, Chippewa Co.

***Asclepias purpurascens* LINN. Spec. 214 (1753).**

A. amoena LINN. Spec. 217 (1753).

Wats. and Coult., Gray's Man. 6 ed. 340; Gray, Syn. Fl. II, 1, 90; Chap., Fl. S. St. 362; Mac., Fl. Can. I, 320; Upham, Fl. Minn. 114; Britt., Fl. N. J. 169; Webb., Fl. Neb. 141; Cov., Fl. Ark. 203.

North America: N. Eng., N. J. and N. Car. to W. Ont., Wisc. and Minn.; S. to Tenn. and Neb.

Minn. valley: Forest district to Cottonwood valley; edges of woods.

HERB.: *Sheldon* 849, Sleepy Eye; *Manning* 7, Lake City.

***Asclepias tuberosa* LINN. Spec. 316 (1753).**

Wats. and Coult., Gray's Man. 6 ed. 340; Britt., Fl. N. J. 170; Webb., Fl. Neb. 141; Upham, Fl. Minn. 115; Mac., Fl. Can. I, 318; Coult., Fl. Colo. 239; Chap., Fl. S. St. 365; Roth., Wheel. Exp. 188; Cov., Fl. Ark. 203; Gray, Syn. Fl. II, 1, 89; Coult., Fl. Tex. 205.

North America: Ont. and L. Huron region to Minn., Dak. and Colo.; S. to N. Eng., N. J. and Fla.; W. to Arizona and Texas.

Minn. valley: Throughout; common; high knolls, prairies and railway embankments.

HERB.: *Taylor* 558, Minnesota lake; *Taylor* 380, Janesville; *Ballard* 575, Prior's lake, Scott Co.; *Ballard* 342, Jordan, Scott Co.; *Sheldon* 775, Sleepy Eye; *Sheldon* 635, Waseca; *Leiberg* 54, "Minnesota"; *Holzinger* 189, Winona Co.; *Herrick* 255, Minneapolis; *Sandberg* 473, Cannon Falls; *Herb. Sheld.* 1754, Minneapolis; *Herb. Moyer* 207, Montevideo.

LXXXIX. CONVULVACEAE. Morning-Glory Family.

Endlicher, *Gen. Pl.* 651 (1836-40); Lindl., *Veg. King.* 633 (1846)—*Cuscutaceae*; Bentham and Hooker, *Gen. Plant.* II, 865 (1876)—excl. *Nolanaceae*; Baillon, *Hist. Pl.* X, 305 (1891); Peter in *Engler and Prantl, Nat. Pflanz.* IV, 3 a, 1 (1891).

Genera: 25-26; temperate and tropical regions; most abundant within the tropics; shrubby climbers, principally tropical America; herbaceous forms widely distributed; center in W. Indies.

Species: 950-1000; 300 in *Ipomea*; 160 in *Cuscuta*; fossil, 10-12, from Tertiary of Europe and U. S.

VOLVULUS MED. Phil. Bot. II, 42 (1791).**Calystegia** R. BR. Prodr. 483 (1810).

Baillon, *Hist. Pl.* X, 324; Benth. and Hook., *Gen. Pl.* II, 874; Durand, *Ind. Gen. Phan.* 286; O. Kuntze, *Rev. Gen.* II, 447; Schenck, *Palaeophyt.* 776; Engler and Prantl, *Nat. Pflanz.* IV, 3 a, 36 (Peter).

Living species: 7; temperate and subtropical regions. N. America, 3-4; W. coast, 1; Atl. regions, 2; W. Tex., 1.

Fossil species: *Convolvulus*, Tertiary, Frankfort (*Ludwig*).

Volvulus spithameus (LINN.) OK. Rev. Gen. II, 447 (1891).*Convolvulus spithameus* LINN. Spec. 158 (1753).*Calystegia spithameus* PURSH, Fl. Am. I, 434 (1814).*C. tomentosa* PURSH, Fl. Am. 431 (1814).

Wats. and Coult., Gray's Man. 6 ed. 369; Britt., Fl. N. J. 180; Upham, Fl. Minn. 110; Mac., Fl. Can. I, 345; Chap., Fl. S. St. 345; Gray, Syn. Fl. II, 1, 215; Engl. Pet., Nat. Pflanz. IV, 3 a, 36.

North America: N. S., Q., Ont., Man. and Saskatchewan; S. to Minn. and Fla.

Minn. valley: N. E. district; rare; dry roadsides and embankments.

HERB.: *Kassube* 194, Minneapolis; *Holzinger* 178, Winona Co.; *Herrick* 244, St. Louis river; *Holzinger* 179, Winona Co.

Volvulus sepium (LINN.) JUNGER, Oestr. Bot. Zeit. 133 (1891).*Convolvulus sepium* LINN. Spec. 218 (1753).*Calystegia sepium* R. BR. Prodr. 483 (1810).

Wats. and Coult., Gray's Man. 6 ed. 369; Britt., Fl. N. J. 179; Webb., Fl. Neb. 134; Upham, Fl. Minn. 110; Mac., Fl. Can. I, 345, 569; Chap., Fl. S. St. 344; Coult., Fl. Colo. 265; Brew. and Wats., Fl. Calif. I, 533; Forbes and Hems., Fl. Sin. II, 164; Hook., Fl. Gt. Brit. 284; Led., Fl. Ross. III, 94; Nym., Fl. Eur.; Roth., Wheel. Exp. 205 *in var.*; Gray, Syn. Fl. II, 1, 215; Suppl. Syn. II, 435 *in var.*; Hart., Fl. Scand. I, 74; Engl. Pet., Nat. Pflanz. IV, 3 a, 36; Coult., Fl. Tex. 292 *in var.*

N. Africa; most Europe; Asia to China and Dahuria; Australia and New Zealand.

North America: Throughout Can. to N. W. T.; S. to N. J. and Del.; W. to Utah, Minn., Neb. and Colo.

Minn. valley: Throughout; river banks and thickets, climbing over shrubbery.

HERB.: *Taylor* 22, Elysian; *Ballard* 501, Prior's lake, Scott Co.; *Sheldon* 1553, Lake Benton; *Ballard* 344, Helena, Scott Co.; *Sheldon* 25, Elysian; *Sheldon* 376, Madison Lake; *Ballard* 133, Chaska; *Ballard* 751, Waconia; *Herrick* 242, St. Louis river; *Herrick* 243, Minneapolis; *Kassube* 193, Minneapolis.

olis; *Sandberg* 456, Red Wing; *Herb. Sheld.* 1701, Minneapolis; *Herb. Moyer* 196, Chippewa river, near Montevideo.

CUSCUTA LINN. Gen. 89 (1737).

Epilinnella and **Engelmannia** PFEIFF. Bot. Zeit. 673 (1845).

Cuscutina PFEIFF. l. c. 492 (1846).

Monogynella, **Cussutha** and **Succuta** DESMOUL. Etud. Cusc. 65, 66, 74 (1853).

Grammica LOUR. Fl. Cochinch. 170 (1790).

Pfeifferia BUCHING. Ann. Sci. Nat. 3, V, 88 (1846).

Lepidanche ENGELM. Sill. Journ. XLIII, 343 (1842).

Buchingera SCHULTZE, Jahrb. Pharm. (1847).

Baillon, *Hist. Pl.* X, 330; Benth. and Hook., *Gen. Pl.* II, 881; Durand, *Ind. Gen. Phan.* 287; Engler and Prantl, *Nat. Pflanz.* IV, 3 a, 38 (Peter).

Living species: 160; temperate and warmer regions. N. America, 21; Europe, 12; Russian Europe, 7; California, 8; E. Sts., 10; Rocky mts., 6; S. Sts., 8; Pl. Wheel., 5; Pl. King, 3; W. Tex., 12.

Cuscuta paradoxa RAF. Ann. Nat. (1820).

C. glomerata CHOISY, Mem. Genev. (1841).

Lepidanche compositarum ENGELM. Am. Jour. Sci. XLIII (1842).

Wats. and Coult., Gray's Man. 6 ed. 372; Webb., Fl. Neb. 134; Upham, Fl. Minn. 111; Wats., King Exp. 472; Cov., Fl. Ark. 205; Gray, Syn. Fl. II, 1, 222; Engl. Pet., Nat. Pflanz. IV, 3 a, 39; Coult., Fl. Tex. 295.

North America: Ohio to Minn., Neb., Kan. and Tex.

Minn. valley: Throughout; on Composites, especially *Helianthus* and *Solidago*.

HERB.: *Taylor* 849, Glenwood; *Sheldon* 1309, Lake Benton; *Kassube* 196, Minneapolis; *Sandberg* 458, Red Wing; *Herrick* 245, Minneapolis; *Herb. Moyer* 197, Chippewa river, near Montevideo; *Herb. Wickersheim* 104, Idlewild, Lincoln Co.

Cuscuta gronovii WILLD. Reliq. in R. and S. Syst. VI, 205 (1820).

C. americana LINN. Spec. 124 (1753) as to pl. Gronov.

C. umbrosa BEY. Hook. Fl. Bor-Am. II, 78 (1840) in part.

C. vulgivaga ENGELM. Am. Jour. Sci. XLIII, 338 (1842).

Wats. and Coult., Gray's Man. 6 ed. 372; Britt., Fl. N. J. 180; Webb., Fl. Neb. 134; Chap., Fl. S. St. 347; Mac., Fl. Can. I, 347; Coult., Fl. Colo. 267; Upham, Fl. Minn. 111; Wats., King Exp. 472; Cov., Fl. Ark. 206; Gray, Syn. Fl. II, 1, 221; Engl. Pet., Nat. Pflanz. IV, 3a. 39; Coult., Fl. Tex. 295.

North America: N. S., N. Br., Ont. to S. Man.; S. to N. Eng., N. J. and Fla.; W. to Minn., Neb., Colo., Tex. and Ark.

Minn. valley: Throughout; on coarse herbs and shrubs; abundant on *Impatiens* and *Salix*.

HERB. *Ballard* 592, Prior's lake, Scott Co.; *Sheldon* 660, Waseca; *Sheldon* 717, Sleepy Eye; *Taylor* 1001, Glenwood; *Sheldon* 1082, Springfield; *Sandberg* 457, Cannon Falls; *Bailey* 180, Vermilion lake; *Holtz*. 40, Cedar lake, Hennepin Co.

***Cuscuta gronovii* WILLD. var. *saururi* (ENGELM.).**

C. saururi ENGELM. Am. Jour. Sci. XLIII (1842).

C. gronovii var. *latiflora* ENGELM. Trans. St. L. Acad. I, III, (1859).

Wats. and Coult., Gray's Man. 6 ed. 372; Upham, Fl. Minn. 111; Wats., King Exp. 472; Gray, Syn. Fl. II, 1, 222.

North America: Mass. and N. Car. to Minn., Man. and Mo.

Minn. valley: N. E. district; on *Impatiens*.

***Cuscuta coryli* ENGELM. Am. Jour. Sci. XLIII, 337 (1842).**

C. umbrosa BEYRICH, Sched. (1851) *in part*.

C. inflexa ENGELM. Rev. Cusc. 502 (1859).

Wats. and Coult., Gray's Man. 6 ed. 372; Gray, Syn. Fl. II, 2, 221; Coult., Fl. Colo. 267; Webb., Fl. Neb. 134; Chap., Suppl. S. St. 641.

North America: N. Eng. to Ark., Neb., Colo. and Dak.

Minn. valley: W. district; on *Ceanothus* and *Corylus*.

HERB.: *Wickersheim* 132, Ash lake, Lincoln Co.

***Cuscuta cephalanthi* ENGELM. Am. Jour. Sci. 333 (1842).**

C. tenuiflora ENGELM. Gray's Man. 1 ed. 350 (1848).

Wats. and Coult., Gray's Man. 6 ed. 371; Britt., Fl. N. J. 180; Mac., Fl. Can. I, 347; Upham, Fl. Minn. 110; Brew. and Wats., Fl. Calif. I, 535; Gray, Syn. Fl. II, 220; Wats., King Exp. 273, 471; Engl. Pet., Nat. Pflanz. IV, 3a, 39; Webb., Appx. Neb. 36; Coult., Fl. Tex. 294.

North America: Saskatchewan to Minn., Wisc., Penn. and N. J.; S. to Ark. and Tex.; W. to Utah? and Arizona.

Minn. valley: Reported from Blue Earth Co., and probably sparingly throughout forest district; on tall herbs and shrubs.

***Cuscuta arvensis* BEYRICH, Sched. (1851).**

C. arvensis var. *pentagona* ENGELM. Gray's Man. ed. II, 336 (1852).

C. pentagona ENGELM. Am. Jour. Sci. XLIII, 342 (1842).

C. arvensis var. *verrucosa* ENGELM. Gray's Man. ed. 2, 336 (1852).

C. verrucosa ENGELM. Am. Jour. Sci. XLIII, 340 (1842).

C. arvensis var. *calycina* ENGELM. Am. Jour. Sci. l. c. (1842).

Wats. and Coult., Gray's Man. 6 ed. 371; Gray, Syn. Fl. II, 2, 220; Webb., Fl. Neb. 134; Britt., Fl. N. J. 180; Chap., Fl. S. St. 347; Mac., Fl. Can. I, 346; Coult., Fl. Colo. 266; Brew. and Wats., Fl. Calif. I, 535; Coult., Fl. Tex. 294.

South America.

North America: N. S. and Ont. to N. J. and Fla.; W. to Minn., Mont. and Oregon; S. to Calif., Tex. and La.

Minn. valley : W. district to S. Central district; on small prairie herbs.

HERB.: *Sheldon* 1435, Pipestone; *Taylor* 1143, Glenwood; *Leiberg* 106, Blue Earth Co.; *MacM.* and *Sheld.* 56, Brainerd.

***Cuscuta polygonorum* ENGELM.** Am. Jour. Sci. XLIII, 342 (1842).

C. chlorocarpa ENGELM. Gray's Man. ed. 1, 350 (1848).

Wats. and Coult., Gray's Man. 6 ed. 371; Upham, Fl. Minn. 110; Webb., Fl. Neb. 134; Wats., King Exp. 471; Cov., Fl. Ark. 206; Gray, Syn. Fl. II, 1, 220.

North America: Wisc. and Minn. to Penn. and Del.; S. to Neb. and Ark.

Minn. valley: Blue Earth Co. and perhaps whole forest district; on *Polygonum* and other herbs.

XC POLEMONIACEAE. Phlox Family.

Endlicher, *Gen. Pl.* 656 (1836-40); Bentham and Hooker, *Gen. Plant.* II, 820 (1876); Baillon, *Hist. Pl.* X, 332 (1891); Peter, in *Engler and Prantl, Nat. Pflanz.* IV, 3a, 40 (1891).

Genera: 8; Mexico and N. America; especially in western portion; a few in Siberia and the southern Cordilleran region.

Species: 200±; 190, N. America and Mexico.

PHLOX LINN. Gen. 148 (1737).

***Armeria* LINN.** Systema (1735).

Baillon, *Hist. Pl.* X, 340; Benth. and Hook., *Gen. Pl.* II, 821; Durand, *Ind. Gen. Phan.* 279; Engler and Prantl, *Nat. Pflanz.* IV, 3a, 46 (Peter).

Living species: 30±, North America; 1 sp. in Siberia. Canada, 12; S. Sts., 11; Rocky mts., 8; E. Sts., 11; California and Pac. coast, 6-7; Pl. Wheel., 4; Pl. King, 4; W. Tex., 4.

***Phlox divaricata* LINN.** Spec. 217 (1753).

P. canadensis SWEET, Brit. Fl. Gard. 221 (1823-1829).

P. glutinosa BUCKL. Am. Jour. Sci. XLV, 177 (1844).

Wats. and Coult., Gray's Man. 6 ed. 355; Mac., Fl. Can. I, 328; Webb., Fl. Neb. 134; Chap., Fl. S. St. 338; Upham, Fl. Minn. 110; Mac., Fl. Can. I, 566; Wats., King Exp. 462; Cov., Fl. Ark. 204; Gray, Syn. Fl. II, 1, 131; Engl. Pet., Nat. Pflanz. IV, 3a, 47.

North America: Q., Ont. to Owen Sound; S. to N. Y., Fla.; W. to Minn., Neb. and Ark.

Minn. valley: Throughout; prairies, woods and meadows.

HERB.: *Taylor* 138, Janesville; *Taylor* 309, Janesville, *Sheldon* 81, Elysian; *Ballard* 401, Jordan, Scott Co.; *Manahan* 1,

Chatfield; *Holzinger* 177, Winona Co.; *Sandberg* 454, Cannon Falls; *Herb. Sheld.* 1876, Minneapolis; *Herb. Wickersheim* 103, Mankato; *Herb. Moyer* 195, Montevideo.

Phlox pilosa LINN. Spec. 216 (1753).

P. aristata MICHX. Fl. N. Am. I, (1803).

P. cuspidata SCHEELE, Linn. XXIII, 137 (1865).

Wats. and Coult., Gray's Man. 6 ed. 355; Britt., Fl. N. J. 174; Webb., Fl. Neb. 135; Chap., Fl. S. St. 339; Upham, Fl. Minn. 110; Mac., Fl. Can. I, 327; Wats., King. Exp. 462; Cov., Fl. Ark. 204; Gray, Syn. Fl. II, 1, 130; Engl. Pet., Nat. Pflanz. IV, 3 a, 47; Coult., Fl. Tex. 276.

North America: Ont. and Saskatchewan to Minn., N. J., Fla., Tex. and Ark.

Minn. valley: Throughout; prairies, banks and fields.

HERB.: *Sheldon* 754, Sleepy Eye; *Sheldon* 1320, Lake Benton; *Ballard* 572, Prior's lake, Scott Co.; *Ballard* 642, Chaska; *Ballard* 98, Shakopee, *Sheldon* 537, Waseca; *Taylor* 343, Janesville; *Sheldon* 1599, Lake Benton; *Sheldon* 633a, Wilton, Waseca Co.—white-flowered forma *albiflora*; *Taylor* 577, Minnesota lake; *MacMillan* 10, Glenwood; *Taylor* 833, Glenwood; *Taylor* 773, Glenwood; *Huntington* 11, Rock Co.; *Kassube* 192, Minneapolis; *Oestlund* 144, Ramsey Co.; *Leonard* 40, Minneapolis; *Oestlund* 145, Hennepin Co.; *Leonard* 41, Spring Valley; *Sandberg* 453, Red Wing; *Hammond* 30, Lake City; *Herb. Sheld.* 1919, Minneapolis; *Herb. Wickersheim* 102, Idlewild, Lincoln Co.; *Herb. Moyer* 194, Chippewa river, near Montevideo.

Phlox glaberrima LINN. Spec. 152 (1753).

P. revoluta AIK. Eat. Man. (1836).

? *P. carnea* SIMS.

Wats. and Coult., Gray's Man. 6 ed. 355; Upham, Fl. Minn. 109; Chap., Fl. S. St. 338; Gray, Syn. Fl. II, 1, 130; Wats., King Exp. 462; Cov., Fl. Ark. 204.

North America: N. Va. to Ohio, Minn. and Ark.; S. to Fla. and Tex.

Minn. valley: Forest district to New Ulm; rare; prairies and meadows along streams.

Phlox maculata LINN. Spec. 152 (1753).

P. pyramidalis SM. Exot. II, 87 (1804-1805).

P. reflexa SWEET, Brit. Fl. Gard. 232 (1823-1829).

P. penduliflora SWEET, Brit. Fl. Gard. Ser. 2, 46 (1831-1838).

Wats. and Coult., Gray's Man. 6 ed. 354; Britt., Fl. N. J. 174; Upham, Fl. Minn. 109; Chap., Fl. S. St. 338; Gray, Syn. Fl. II, 1, 129; Wats., King. Exp. 462; Cov., Fl. Ark. 204; Engl. Pet., Nat. Pflanz. IV, 3a, 47.

North America: N. J. to Minn.; S. to Fla. and Ark.

Minn. valley: N. E. district; infrequent; wet meadows and banks of streams.

HERB.: *Thuet* 1, Dodge Co.

COLLOMIA NUTT. Gen. I, 126 (1818).**Courtoisia** REICH. Ic. Pl. Exot. III 4, t. 208 (1830).**Phloganthea** CAV. ex Peter, l. c. (1891).Baillon, *Hist. Pl.* X, 340; Benth. and Hook., *Gen. Pl.* II, 822; Durand, *Ind. Gen. Phan.* 279; Engler and Prantl, *Nat. Pflanz.* IV, 3a, 48 (Peter).Living species: 18; Western N. America and Chile. N. America, 10-11; West Mexico and S. America. S. W. America, 3; N. W. America, 7-8. *C. linearis* is the only one that comes into Atl. America.**Collomia linearis** NUTT. Gen. I, 126 (1818).*Gilia linearis* GRAY, Proc. Am. Acad. XVII, 223 (1882).*Navarretia linearis* OK. Rev. Gen. II, 432 (1891).

Wats. and Coult., Gray's Man. 6 ed. 356; Mac., Fl. Can. I, 329; Upham, Fl. Minn. 110; Coult., Fl. Colo. 249; Brew. and Wats., Fl. Calif. I, 487; Gray, Syn. Fl. II, 1, 135 and 408; Engl. Pet., Nat. Pflanz. IV. 3 a. 48; Webb., Appx. Neb. 36.

North America: N. Br. to Saskatchewan and Vancouver; N. to Ft. Franklin on Mackenzie; S. in Sierras to Calif.; in Rocky Mts. to Colo.; S. to Minn., Dak. and Neb.

Minn. valley: S. W. edge and far W. in Dakota; prairies and high knolls.

HERB.: Sandberg 455, Red Wing.

POLEMONIUM LINN. Gen. 131 (1737).Baillon, *Hist. Pl.* X, 339; Benth. and Hook., *Gen. Pl.* II, 823; Durand, *Ind. Gen. Phan.* 279.

Living species: 8-9; Europe, Asia, temperate N. America, Mexico and Chile. Russia, 2; Europe, 1; N. America, 8; Rocky mts., 5; California and Pac. coast, 6-7; Canada, 4; E. Sts., 2; S. Sts., 1; Pl. King, 5; Pl. Wheel., 3.

Polemonium reptans LINN. Spec. ed. 2, (1762).

Wats. and Coult., Gray's Man. 6 ed. 356; Britt., Fl. N. J. 175; Chap., Fl. S. St. 340; Upham, Fl. Minn. 109; Gray, Syn. Fl. II, 1, 151; Wats., King Exp. 470; Cov., Fl. Ark. 205.

North America: N. J. to Minn.; S. to Alab., Mo. and Ark.

Minn. valley: New Ulm to Alexandria and W?; woods and thickets.

HERB.: Sandberg 451, Goodhue Co.; Holzinger 176, Winona Co.; Hammond 2, Lake City; Sandberg 452, Cannon Falls.

XCI. HYDROPHYLLACEAE. Waterleaf Family.

Endlicher, *Gen. Pl.* 658 (1836-40); Bentham and Hooker, *Gen. Plant.* II, 825 (1876); Baillon, *Hist. Pl.* X, 397 (1891)—*sub Boraginacées*.

Genera: 15; N. America; a very sparing representation in S. America, Africa and the tropics.

Species: 150; N. America; 3-4 around world and S. America or S. Africa.

MACROCALYX TREW. Nov. Act. Cur. II, 330 (1761).

Ellisia LINN. Spec. ed. II, Appx. (1763).

Nyctalea SCOP. Introd. 775 (1777).

Encrypta NUTT. Jour. Acad. Phil. 2, I, 158 (1848).

Baillon, *Hist. Pl.* X, 397; Benth. and Hook., *Gen. Pl.* II, 827; Durand, *Ind. Gen. Phan.* 280; O. Kuntze, *Rev. Gen.* II, 433 (1891).

Living species: 3; N. America; 1, Can., Rocky mts., E. Sts.; 2, California.

Macrocalyx nyctalea (LINN.) OK. Rev. Gen. II, 434 (1891).

Ipomea nyctalea LINN. Spec. (1753).

Polemonium nyctalea LINN. Spec. 2 ed. (1762).

Ellisia nyctalea LINN. Spec. 2 ed. Appx. 1662 (1763).

E. ambigua NUTT. Gen. I, 118 (1818).

Wats. and Coult., Gray's Man. 6 ed. 359; Britt., Fl. N. J. 176; Brew. and Wats., Fl. Calif. I, 505; Coult., Fl. Colo. 255; Mac., Fl. Can. I, 322; Upham, Fl. Minn. 109; Webb., Fl. Neb. 135; Cov., Fl. Ark. 205; Gray, Syn. Fl. II, 1, 157.

North America: Qu'Appelle to Saskatchewan and N. W. T.; S. to N. Eng., N. J. and Va.; W. to Minn., Mo., Dak., Neb., Colo. and Arkansas river.

Minn. valley: Throughout; grassy places, rich woods and banks of streams or lakes.

HERB.: *Ballard* 348, Helena, Scott Co.; *Taylor* 182, Janesville; *Ballard* 80, Chaska; *Taylor* 350, Janesville; *Sheldon* 672, Waseca; *Sheldon* 135a, Madison Lake; *Foote* 3, Worthington; *Herrick* 241, Minneapolis; *Sandberg* 450, Cannon Falls; *Holzinger* 175, Winona; *Herb. Sheld.* 1766, Ft. Snelling; *Herb. Wickersheim* 101, Idlewild, Lincoln Co.; *Herb. Moyer* 193, Chipewa river, near Montevideo.

HYDROPHYLLUM LINN. Gen. 124 (1737).

Viticella MITCH. Act. Med. Cur. VIII, 220 (1748).

Decemium RAF. Fl. Lud. 33 (1817).

Baillon, *Hist. Pl.* X, 397; Benth. and Hook., *Gen. Pl.* II, 826; Durand, *Gen. Phan.* 279.

Living species: 6; N. America; Canada, 5; S. Sts., 4;

E. Sts., 4; Rocky mts., 2; Pl. King, 2; Pl. Wheel., 2; California, 3.

Hydrophyllum appendiculatum MICHX. Fl. N. Am. I, 134 (1803).

Hydrophyllum trilobum RAF. Fl. Lud. 33 (1817).

Nemophila paniculata SPRENG. Syst. I, 569 (1825).

Decemium hirtum RAF. Med. Fl. II, 215 (1830).

Wats. and Coult., Gray's Man. 6 ed. 358; Mac., Fl. Can. I, 332; Upham, Fl. Minn. 109; Gray, Syn. Fl. II, 1, 155.

North America: Ont. to Minn.; S. to N. Car., Iowa and Mo.

Minn. valley: Forest district except far N. E.; woods and rich, shaded banks.

HERB.: *Sheldon* 400, Stony Point, Lake Madison, Blue Earth Co.; *Sheldon* 556, Waseca.

Hydrophyllum virginianum LINN. Spec. 208 (1753).

H. virginicum AUCT.

Wats. and Coult., Gray's Man. 6 ed. 358; Britt., Fl. N. J. 175; Upham, Fl. Minn. 109; Mac., Fl. Can. I, 331; II, 343; I, 567; Chap., Fl. S. St. 334; Webb., Fl. Neb. 135; Coult., Fl. Colo. 254; Brew. and Wats., Fl. Calif. I, 502; Roth., Wheel. Exp. 201; Cov., Fl. Ark. 205; Gray, Syn. Fl. II, 1, 154.

North America: Q. to Georgian bay and Pac.; Vancouver, N. W. T. and Alaska; S. to Washington and Oregon; S. in mts. to N. Mex.; S. in Mississippi valley to Ark. and La.; along Appalachians to N. Eng., N. Y., Ga.

Minn. valley: Throughout; rich woods, river banks and lake shores.

HERB.: *Taylor* 6, Elysian; *Taylor* 623, Minnesota lake; *Taylor* 119, Janesville; *Sheldon* 858, Sleepy Eye; *Ballard* 41, Chaska; *Herrick* 239, Minneapolis; *Kassube* 191, Minneapolis; *Herrick* 240, Minneapolis; *Herb. Sheld.* 1785, Minneapolis; *Herb. Wickersheim* 100, Idlewild, Lincoln Co.; *Herb. Moyer* 192, Montevideo.

PHACELIA JUSS. Gen. 129 (1789).

Aldea R. and P. Prodr. Per. 19 (1798).

Eutoca R. BR. Appx. Frankl. Exp. 764 (1823).

Cosmanthus NOLTE, ex DC. Prodr. IX, 291 (1845).

Microgenetes A. DC. l. c. (1845).

Whitlavia HOOK. Bot. Mag. t. 4813 (—).

Heteryta RAF. Jour. Phys. LXXXIX, 101 (1819).

Helminthosporium Torr. Herb.

Baillon, *Hist. Pl.* X, 398; Benth. and Hook., *Gen. Pl.* II, 827; Durand, *Ind. Gen. Phan.* 280.

Living species: 65±; N. America, Mexico, Andes of Chile; N. America, 55; S. Sts., 5; Canada, 4; Rocky mts., 6;

Pl. King, 17; California, 40-45; E. Sts., 6; Pl. Wheel., 10; W. Tex., 8.

Phacelia purshii BUCKL. Am. Jour. Sci. XLV, 172 (1844).

P. fimbriata PURSH, Fl. Am. (1814) not Michx.

Cosmanthus fimbriatus A. DC. Prodr. IX, 297 (1845).

Wats. and Coult., Gray's Man. 6 ed. 359; Chap., Fl. S. St. 355; Upham, Fl. Minn. 109; Gray, Syn. Fl. II, 1, 162; Cov., Fl. Ark. 205.

North America: W. Penn. to Minn.; S. to Tenn., N. Car., Alab. and Ark.

Minn. valley: Reported from S. E. edge; rare or doubtful; woods and shaded banks.

XCII. BORRAGINACEAE. Borage Family.

Lindl., Veg. King. 655 (1846); Lehm., Pl. Asp. (1818)—*Asperifoliae*; Endlicher, Gen. Pl. 643 (1836-40)—*Cordiaceae*; Lindl., Veg. King. 653 (1846)—*Ehretiaceae*; Bentham and Hooker, Gen. Pl. II, 832 (1876); Baillon, Hist. Pl. X, 343 (1891)—excl. *Hydrophyllaceae*.

Genera: 75; (B. and H.—68); cosmopolitan; especially abundant in the Orient.

Species: 1250±; 3-4 doubtful fossils in Tertiary; *Boraginites*.

ONOSMODIUM MICHX. Fl. Bor.-Am. I, 132 (1803).

Purshia SPRENG. Lehm. Asperif. 382 (1818).

Osmodium RAF. N. Y. Med. Rep. II, V, 350 (1808).

Baillon, Hist. Pl. X, 384; Benth. and Hook., Gen. Pl. II, 859; Durand, Ind. Gen. Phan. 284.

Living species: 6; N. America and Mexico. N. Amer., 4; S. Sts., 2; Canada, 2; Rocky mts., 1; E. Sts., 1; Pl. Wheel., 1; W. Tex., 2.

Onosmodium carolinianum (LAM.) DC. Prodr. X, 70 (1846).

Lithospermum carolinianum LAM. Ill. and Enc. Meth. Suppl. II, 837 (1811).

Purshia mollis LEHM. Asper. 383 (1821).

Onosmodium molle BECK, Bot. (1833).

Wats. and Coult., Gray's Man. 6 ed. 366; Coult., Fl. Colo. 264; Webb., Fl. Neb. 135; Upham., Fl. Minn. 106; Chap., Fl. S. St. 331; Mac., Fl. Can. I, 342; Cov., Fl. Ark. 206; Gray, Syn. Fl. II, 1, 206; Coult., Fl. Tex. 288.

North America: Ont., W. N. Y. and Penn. to Minn., Colo. and Neb.; S. to Ga., Ark. and Tex.

Minn. valley: Districts E. of Pommes des Terres river; river banks and edges of sloughs.

HERB.: ?Sandberg 443, Cannon Falls; Ballard 185, Jordan, Scott Co.; Taylor 644, Minnesota lake; Herb. Moyer 189, Montevideo.

Onosmodium carolinianum (LAM.) DC. var. **molle** (MICHX.) GRAY, Syn. II, 1, 206 (1886).

Onosmodium molle MICHX. Fl. N. Am. I, 133 (1803).

Purshia mollis LEHM. Asper. 383 (1821).

Wats. and Coult., Gray's Man. 6 ed. 367; Mac., Fl. Can. I, 343; Webb., Fl. Neb. 135; Upham, Fl. Minn. 107; Coult., Fl. Colo. 264; Coult., Fl. Tex. 288.

North America: Man. and Saskatchewan to 49° N. lat.; S. to Neb., Ill. and Tex.; W. to Colo. and Utah.

Minn. valley: Throughout; river banks and waste places or dry fields.

HERB.: *Sheldon* 1505, Lake Benton; *Sheldon* 736, Sleepy Eye; *Taylor* 352, Janesville; *Ballard* 101, Shakopee; *Taylor* 810, Glenwood; *Leonard* 38, Spring Valley.

LITHOSPERMUM LINN. Gen. 101 (1737).

Rhytispermum LINK, Handb. I, 579 (1829).

Aegonychon S. F. GRAY, Arr. II, 354 (1821).

Batschia GMEL. Syst. II, 315 (1806).

Pentalophum DC. Prodr. X, 86, (1846).

Margarospermum DECNE. Jacq. Voy. Bot. 122 (1844).

Lithodora GRISEB. Spic. Fl. Rum. II, 85 (1844).

Gymnoleima DECNE Jacq. Voy. Bot. 122 (1844).

Baillon, *Hist. Pl.* X, 383; Benth. and Hook., *Gen. Pl.* II, 860; Durand, *Ind. Gen. Phan.* 284.

Living species: 40±; extra-tropical regions, N. hemisphere; also W. S. America and S. Africa; species in S. hemisphere doubtfully endemic. Europe, 16; Russia, 7; Russian Europe, 4; N. America, 9; S. Sts., 5; Rocky mts., 5; California, 2; Canada, 5; E. Sts., 4; Pl. Wheel., 3; Pl. King, 4; W. Tex., 5.

Lithospermum angustifolium MICHX. Fl. N. Am. I, 130 (1803).

Batschia longiflora PURSH, Fl. Am. 132 (1814).

B. decumbens NUTT. Gen. I, 114 (1818).

Lithospermum longiflorum SPRENG. Syst. (1825).

L. breviflorum ENGELM. and GRAY, Pl. Lindh. I, 44 (1845).

Pentalophus longiflorus and *mandanense* A. DC. Prodr. X, 87 (1846).

Wats. and Coult., Gray's Man. 6 ed. 366; Mac., Fl. Can. I, 342; Upham, Fl. Minn. 107; Webb., Fl. Neb. 135; Coult., Fl. Colo. 264; Wats., King Exp. 238; Cov., Fl. Ark. 206; Gray, Syn. Fl. II, 1, 205; Coult., Fl. Tex. 288.

North America: Man., Saskatchewan and Brit. Col. to 55° N. lat. ?; S. to Utah, Arizona, Tex., Ark., Neb., Ill. and Ind.

Minn. valley: Throughout; river banks and edges of sloughs.

HERB.: *Ballard* 379, Jordan, Scott Co.; *Sheldon* 798, Sleepy Eye; *Herrick* 235, Minneapolis; *Kassube* 186, Minneapolis; *Sandberg* 444, Cannon Falls; *Sandberg* 445, Goodhue Co.; *Holzinger* 171, Winona Co.; *Herb. Wickersheim* 98, Idlewild; *Herb. Moyer*, 190, Montevideo.

***Lithospermum carolinense* (WALT.).**

Anonymos caroliniensis WALT. Fl. Car. 91 (1788).

Batschia carolinensis GMEL. Syst. I, 315 (1805).

B. gmelini MICHX. Fl. N. Am. I, 130 (1803).

Anchusa hirta MUHL. Cat. (1813).

Lithospermum hirtum LEHM. Asper. 305 (1818).

Batschia caroliniana R. S. Syst. IV, 52 (1819).

Lithospermum decumbens TORR. Ann. Lyc. N. Y. II, 225 (1834).

L. bejariense DC. Prodr. X. 88 (1846).

Wats. and Coult., Gray's Man. 6 ed. 366; Mac., Fl. Can. I, 342; Upham, Fl. Minn. 107; Coult., Fl. Colo. 264; Chap., Fl. S. St. 352; Wats., King Exp. 238; Cov., Fl. Ark. 206; Gray, Syn. Fl. II, 1, 205; Coult., Fl. Tex. 288.

North America: Ont. to L. Huron and N. Y.; S. to Fla.; W. to Minn., Neb., Colo., Ark. and Tex.

Minn. valley: Throughout; waste or barren land.

HERB.: *Ballard* 641, Chaska; *Ballard* 247, Jordan, Scott Co.; *Sheldon* 696, Waseca; *Ballard* 202, Jordan, Scott Co.; *Taylor* 557, Minnesota lake; *Sheldon* 973, Sleepy Eye; *Kassube* 187, Minneapolis; *Herrick* 236, Minneapolis; *Holzinger* 172, Winona Co.; *Holzinger* 173, Winona; *Sandberg* 446, Cannon Falls; *Hammond* 28, Lake City.

***Lithospermum canescens* (MICHX.) LEHM. Asper. 305 (1818).**

Batschia canescens MICHX. Fl. N. Am. I, 130 (1803).

Anchusa canescens MUHL. Cat. (1813).

Lithospermum sericeum LEHM. Asper. 306 (1818).

Wats. and Coult., Gray's Man. 6 ed. 366; Mac., Fl. Can. I, 342; Chap., Fl. S. St. 332; Upham, Fl. Minn. 107; Webb., Fl. Neb. 135; Britt., Fl. N. J. 178; Coult., Fl. Colo. 264; Roth., Wheel. Exp. 203; Cov., Fl. Ark. 206; Gray, Syn. Fl. II, 1, 204.

North America: Ont. to Saskatchewan; S. to N. Y., N. J., Va. and Alab.; W. to Dak., Neb., Ark., Arizona and N. Mex.

Minn. valley: Throughout; waste or gravelly soil and openings in forest.

HERB.: *Taylor* 185, Janesville; *Herrick* 237, Minneapolis; *Sandberg* 447, Red Wing; *Sandberg* 448, Cannon Falls; *Oestlund* 143, Ramsey Co.; *Kassube* 188, Minneapolis; *Leonard* 39, Fillmore Co.; *Hammond* 29, Lake City; *Herb. Wickersheim* 99, Idlewild, Lincoln Co.; *Herb. Moyer* 191, Montevideo.

Lithospermum latifolium MICHX. Fl. N. Am. I, 131 (1803).

L. officinale var. *latifolium* WILLD. Spec. I, 751 (1798).

L. lutescens COL. Cat. Fl. G. Rap. 29 (1874).

Wats. and Coult., Gray's Man. 6 ed. 365; Mac., Fl. Can. I, 341; Upham, Fl. Minn. 107; Gray, Syn. Fl. II, 1, 203; Webb., Appx. Neb. 37.

North America: Ont. and N. Y. to Minn.; S. to Va., Neb. and Ark.

Minn. valley: Forest district, especially S.; edges of woods and thickets.

HERB.: *Sheldon* 516, Waseca; *Taylor* 4, Elysian; *Sheldon* 127, Madison Lake; *Taylor* 258, Janesville; *Sheldon* 621, Wilton, Waseca Co.; *Kassube* 185, Minneapolis; *Herrick* 234, Minneapolis; *Getty* 3, Wright Co.

MYOSOTIS LINN. Gen. 102 (1737).

Exarrhena R. BR. Prodr. 495 (1810).

Strophostoma TURCZ. Bull. Soc. Imp. Mosc. 258 (1840).

Baillon, *Hist. Pl.* X, 386; Benth. and Hook., *Gen. Pl.* II, 858; Durand, *Ind. Gen. Phan.* 284; Schenck, *Palaeophyt.* 777.

Living species: 40±; temperate and cold regions of N. hemisphere, also in S. hemisphere of old world, extra-tropical. Europe, 16; Russian Europe, 10; N. America, 4; Canada, 4; Rocky mts; 1; California, 2; E. Sts., 3; S. Sts., 2; W. Tex., 1.

Fossil species: Forest bed of Norfolk and Mandesley *M. caespitosa* Schultes (*Schenck*).

Myosotis virginica (LINN.). B. S. P. Cat. N. Y. (1888).

Lycopsis virginica LINN. Spec. 139 (1853).

Myosotis verna NUTT. Gen. II, addit. (1818).

M. inflexa ENGELM. Am. Jour. Sci. XLVI, 98 (1845).

M. stricta GRAY, Man. 1 ed. (1848).

Wats. and Coult., Gray's Man. 6 ed. 365; Britt., Fl. N. J. 178; Upham, Fl. Minn. 107; Mac., Fl. Can. I, 341; Chap., Fl. S. St., 333; Brew. and Wats., Fl. Calif. I, 522; Cov., Fl. Ark. 206; Mac., Fl. Can. I, 569 *in var.*; Gray, Syn. Fl. II, 1, 202; Coult., Fl. Tex. 287.

North America: Ont. to Man. and to Brit Col. *in var.*; S. to N. Eng., N. J. and Fla.; W. to Oregon, Tex., Mo. and Ark.

Minn. valley: Reported from S. W. corner; rare; dry or waste places, or on ledges of rock.

Myosotis arvensis (LINN.) WILLD. Spec. I, 747 (1797).

M. scorpioides var. *arvensis* LINN. Spec. 188 (1753).

M. intermedia LINK, DC. Prodr. X, 105 (1846).

Wats. and Coult., Gray's Man. 6 ed. 365; Britt., Fl. N. J. 178; Mac., Fl. Can. I, 340; Upham, Fl. Minn. 107; Hook., Fl. Gt. Brit. 281; Nym.,

Fl. Eur.; Herd., Fl. Eur. Russ. 92; Gray, Syn. Fl. II, 1, 202; Hart., Fl. Scand. I, 77.

Northern Africa; Europe; N. and W. Asia to India.

North America: N. B. and N. S. to L. Huron, and S. to N. J. and La.; W. to Minn.?

Minn. valley?: N. E. district; fields and waste or gravelly places.

HERB.: *Herrick* 238, Minneapolis.

LAPPULA HALL (1745). ex O. Kuntze l. c. (1891).

Echinospermum SWARTZ, Lehm. Asperif. 113 (1818).

Rochelia R. and S. Syst. IV, 11 (1819).

Guettardia MANETTI (1751). ex O. Kuntze l. c. (1891).

Cynoglossospermum SIEGESB. Fl. Petr. 40 (1736).

Heterocaryum A. DC. Prodr. X, 144 (1846).

Baillon, *Hist. Pl.* X, 372; Benth. and Hook., *Gen. Pl.* II, 850; Durand, *Ind. Gen. Phan.* 283; O. Kuntze, *Rev. Gen.* II, 436.

Living species: $50 \pm$; all temperate regions; S. Africa, Australia. Especially N. hemisphere in old world. Europe, 5; Russia, 10; N. America, 7-8; Canada, 7-8; S. Sts., 3; California, 4; E. Sts., 4; Rocky mts., 3-4; Pl. Wheel., 2; Pl. King, 3; W. Tex., 1.

Lappula virginiana (LINN.) GREENE, *Pittonia* II, 182 (1891).

Myosotis virginiana LINN. Spec. 131 (1753).

M. virginica LINN. Spec. 2 ed. 189 (1762).

Echinospermum virginicum LEHM. Asper. 120 (1818).

Cynoglossum morisoni DC. Prodr. X, 155 (1846).

Echinospermum virginianum HITCHCOCK, Fl. Ames 509 (1891).

Wats. and Coult., Gray's Man. 6 ed. 362; Upham, Fl. Minn. 108; Mac., Fl. Can. I, 336, 568; Britt., Fl. N. J. 177; Chap., Fl. S. St. 333; Webb., Fl. Neb. 135; Cov., Fl. Ark. 205; Gray, Syn. Fl. II, 1, 189 and Suppl. Syn. II, 421.

North America: N. Br., Q. to L. Superior reg. and Saskatchewan; S. to N. Eng., N. J., Va., La. and Alab.; W. to Minn., Neb. and Ark.

Minn. valley: Throughout; dry or sandy prairies or waste places.

HERB.: *Ballard* 590, Crystal lake, Scott Co.; *Ballard* 399, Jordan, Scott Co.; *Ballard* 625, Chaska; *Ballard* 673, Waconia; *Taylor* 896, Glenwood; *Sheldon* 167, Madison Lake; *Sheldon* 841, Sleepy Eye; *Kassube* 190, Minneapolis; *Holzinger* 174, Winona Co.; *Winchell* 18, Minneapolis; *Herb. Sheld.* 1727, Minneapolis.

Lappula deflexa (WAHL.) GARCKE, var. **americana** (GRAY). Proc. Am. Acad. XVII, 224 (1886).

Myosotis deflexa WAHL. Act. Holm. 113 (1810).

Echinosperrum deflexum LEHM. Asper. 93 (1818) *in part*.

Wats. and Coult., Gray's Man. 6 ed. 363; Gray, Syn. Fl. II, 1, 189 and Suppl. II, 421; Mac., Fl. Can. I, 335, 567; Upham, Fl. Minn. 108; Hart., Fl. Scand. I, 81 (*spec.*); Webb., Appx. Neb. 38.

North America: Saskatchewan and Man. to Dak., Minn., Iowa and Neb.

Minn. valley: S. E. district and far N. W.; dry or waste places.

HERB.: *Taylor 425*, Janesville.

Lappula redowskii (HORNE.) GREENE, var. **pilosum** (NUTT.)

Cynoglossum pilosum NUTT. Gen. I, 114 (1818).

Echinosperrum patulum LEHM. Hook. Fl. Bor.-Am. II, 84 (1840).

E. strictum TORR. Mex. Bound. (1858) *not Ledeb.*

E. pilosum BUCKL. Proc. Phil. Acad. (1861).

E. redowskii var. *occidentale* WATSON, Bot. King Exp. 246 (1871).

Wats. and Coult., Gray's Man. 6 ed. 363; Mac., Fl. Can. I, 336; Coult., Fl. Colo. 259; Webb., Fl. Neb. 135?; Brew. and Wats., Fl. Calif. I, 529; Mac., Fl. Can. I, 568; Led., Fl. Ross. III, 158 (*spec.*); Roth., Wheel. Exp. 202; Gray, Syn. Fl. II, 1, 189 and Suppl. Syn. II, 422; Coult., Fl. Tex. 285.

Species in N. Asia to Dahuria.

North America: Man. to Bear lake and along Sierras to Nev. and Tex.; E. to Minn. and Neb.; Alaska; Arizona.

Minn. valley: Forest district; probably W. to Cottonwood and Chippewa valleys; dry plains and waste places.

HERB.: *Ballard 168*, Shakopee; *Kassube 189*, Minneapolis.

CYNOGLOSSUM LINN. Gen. 100 (1737).

Baillon, *Hist. Pl.* X, 377; Benth. and Hook., *Gen. Pl.* II, 848; Durand, *Ind. Gen. Phan.* 282.

Living species: 70±; cosmopolitan; tropical mts. Russian Europe, 3; N. America, 6; Canada, 4; S. Sts., 1; E. Sts., 1; California, 3; Tex.-Mex., 3.

Cynoglossum virginicum LINN. Spec. 193 (1753).

C. amplexicaule MICHX. Fl. N. Am. I, 132 (1803).

Wats. and Coult., Gray's Man. 6 ed. 362; Britt., Fl. N. J. 176; Mac., Fl. Can. I, 335, 567; Chap., Fl. S. St. 333; Upham, Fl. Minn. 108; Cov., Fl. Ark. 205; Gray, Syn. Fl. II, 1, 188.

North America: N. Br., Q., Ont. to S. Man. and Rocky mts. ?; S. to N. Eng., N. J., Fla.; W. to Minn., Ark. and La.

Minn. valley: N. and N. E. districts; rich, deep woods and edges of swamps.

HERB.: *Sandberg 449*, Cannon Falls.

XCIII. VERBENACEAE. Verbena Family.

Endlicher, *Gen. Pl.* 632 (1836-40); Endlicher, l. c. 639 (*Stilbinae*); Benth. and Hooker, *Gen. Plant.* II, 1131 (1876); Baillon, *Hist. Pl.* XI, 78 (1892).

Genera: $65 \pm$; tropical regions; a few in temperate N. and S. hemisphere; S. rather than N.

Species: 750-800; 1-2, fossil in Tertiary.

LEPTOSTACHYA MITCH. *Act. Med. Cur.* VIII, 212 (1748).

Phryma LINN. *Diss. Chen.* 1092 (1751).

Benth. and Hook., *Gen. Pl.* II, 1137; Durand, *Ind. Gen. Phan.* 319; O. Kuntze, *Rev. Gen.* II, 508; Baillon, *Hist. Pl.* XI, 82.

Living species: 1; Japan, E. Asia and N. America.

Leptostachya leptostachya (LINN.).

Phryma leptostachya LINN. *Spec.* 838 (1753).

Leptostachya carolinensis OK. *Rev. Gen.* II, 508 (1891).

Wats. and Coult., *Gray's Man.* 6 ed. 403; Britt., *Fl. N. J.* 194; Webb., *Fl. Neb.* 140; Upham, *Fl. Minn.* 103; Mac., *Fl. Can.* I, 378, 574; Chap., *Fl. S. St.* 310; Forbes and Hems., *Fl. Sin.* II, 251; Cov., *Fl. Ark.* 210; Gray, *Syn. Fl.* II, 1, 334.

Japan to N. India, E. Siberia and Manchuria.

North America: N. Br., Q., Ont. to Owen Sound and Minn.; S. to N. Eng., N. J. and Fla.; W. to Neb., Ark. and Miss.

Minn. valley: Throughout; not infrequent; woods and river banks or shores of lakes.

HERB.: *Ballard* 890, St. Bonifacius; *Ballard* 771, Swan lake, Carver Co.; *Taylor* 821, Glenwood; *Ballard* 403, Jordan, Scott Co.; *Ballard* 540, Cleary's lake, Scott Co.; *Sheldon* 1095, Springfield; *Ballard* 425, New Prague, Scott Co.; *Sheldon* 565, Waseca; *Sheldon* 890, Sleepy Eye; *Taylor* 665, Cobb river, Blue Earth Co.; *Oestlund* 129, Hennepin Co.; *Sandberg* 421, Cannon Falls; *Kassube* 177, Minneapolis; *Herb. Moyer* 174, 175, Chipewewa river, near Montevideo.

VERBENA LINN. *Gen.* 834 (1737).

Glandularia GMEL. *Syst.* 920 (1807).

Billardiera MOENCH, *Meth.* 396 (1794).

Shuttleworthia MEISSN. *Gen.* 290 (1836).

Uwarowia BUNGE, *Bull. Acad. Petr.* VII, 278 (1840).

Benth. and Hook., *Gen. Pl.* II, 1146; Durand, *Ind. Gen. Phan.* 320; Baillon, *Hist. Pl.* XI, 96.

Living species: $80 \pm$; 1, almost cosmopolitan, the rest in tropical and extratropical America, principally North; also 1 in Mediterranean region and 1 in Australia. N. America, 15; S. Sts., 9; E. Sts., 7; Rocky Mts., 5; Canada, 4; California, 7-8; Pl. Wheel., 3; Pl. King, 2; W. Tex., 11.

Verbena bracteosa MICHX. Fl. N. Am. II, 13 (1803).*V. squarrosa* ROTH, Cat. Bot. III, 3 (1806).*V. canescens* CHAP. Fl. S. St. 370 (1860).

Wats. and Coult., Gray's Man. 6 ed. 402; Webb., Fl. Neb. 139; Upham, Fl. Minn. 103; Mac., Fl. Can. I, 379, 574; II, 349; Coult., Fl. Colo. 291; Brew. and Wats., Fl. Calif. I, 609; Roth., Wheel. Exp. 221, 371; Wats., King. Exp. 234; Cov., Fl. Ark. 210; Gray, Syn. Fl. II, 1, 366; Coult., Fl. Tex. 327;

North America: Ont., Saskatchewan to Brit. Col. and Oregon; S. to Calif., Arizona and Tex.; E. to Colo., Minn. and Ohio.

Minn. valley: Throughout; waste places or dry soil in fields or by roadsides.

HERB.: *Sheldon* 1215, New Ulm; *Ballard* 745, Waconia; *Ballard* 239, Jordan, Scott Co.; *Leonard* 34, Minneapolis; *Winchell* 15, Minneapolis; *Herrick* 218, Minneapolis; *Holzinger* 159, Winona Co.; *Kassube* 176, Minneapolis; *Oestlund* 128, Minneapolis. The two following are *V. bracteosa* x *stricta*? (Upham); *Sheldon* 1218, New Ulm; *Upham* 2, Minneapolis.

Verbena stricta VENT. Hort. Cels. 53 (1800).*V. rigens* MICHX. Fl. N. Am. II, 14 (1803).*V. cuneifolia* RAF. Med. Repos. XI, 260? (1809).

Wats. and Coult., Gray's Man. 6 ed. 402; Britt., Fl. N. J. 194; Upham, Fl. Minn. 103; Webb., Fl. Neb. 139; Chap., Fl. Colo. 291; Cov., Fl. Ark. 211; Gray, Syn. Fl. II, 1, 336; Coult., Fl. Tex. 327.

North America: Minn., Dak. and Ohio to Neb., Ark., Tex. and N. Mex.

Minn. valley: Throughout; dry or sandy places on banks or hills.

HERB.: *Sheldon* 1113, Springfield; *Sandberg* 420, Goodhue Co.; *Herrick* 217, Minneapolis; *Oestlund* 127, Minneapolis; *Kassube* 175, Minneapolis; *Herb. Sheld.* 1699, Minneapolis; *Herb. Moyer* 173, Watson, Chippewa Co.

Verbena hastata LINN. Spec. 29 (1753).*V. paniculata* LAM. Enc. Meth. I (1783).*V. hastata* var. *pinnatifida* PURSH, Fl. Am. 416 (1814).

Wats. and Coult., Gray's Man. 6 ed. 402; Britt., Fl. N. J. 194; Webb., Fl. Neb. 139; Upham, Fl. Minn. 103; Coult., Fl. Colo. 291; Chap., Fl. S. St. 307; Brew. and Wats., Fl. Calif. I, 609; Mac., Fl. Can. I, 379; Roth., Wheel. Exp. 221; Wats., King. Exp. 234; Cov., Fl. Ark. 210; Gray, Syn. Fl. II, 1, 336; Coult., Fl. Tex. 327.

North America: Q., Ont. to N. Eng., N. J. and Fla.; W. to Minn., Ark., Tex., N. Mex. and Miss. Sacramento valley, Calif.

Minn. valley: Throughout; prairies, banks, barren places and forest openings; common.

HERB.: *Taylor* 776, Glenwood; *Ballard* 726, Benton, Carver Co.; *Taylor* 515, Mud lake, Waseca Co.; *Sheldon* 48, Elysian; *Taylor* 648, Minnesota lake; *Sheldon* 776, Sleepy Eye; *Holzinger* 158, Winona Co.; *Kassube* 173, Minneapolis; *Oestlund* 125, Minneapolis; *Leonard* 33, Minneapolis; *Herrick* 215, Minneapolis; *Sandberg* 418, Goodhue Co.; *Herb. Sheld.* 1734, Minneapolis; *Herb. Moyer* 171, Chippewa river, near Montevideo.

***Verbena angustifolia* MICHX.** Fl. N. Am. II, 13 (1803).

V. rugosa WILLD. Enum. 633 (1809).

V. simplex LEHM. Pugill. I, 37 (1828).

Wats. and Coult., Gray's Man. 6 ed. 402; Britt., Fl. N. J. 194; Upham, Fl. Minn. 103; Chap., Fl. S. St. 307; Mac., Fl. Can. I, 379; Cov., Fl. Ark. 210; Gray, Syn. Fl. II, 1, 336.

North America: Q. and Ont. to Mass., N. J. and Fla.; W. to Minn. and Ark.

Minn. valley: N. E. district; rare; dry soil or shaded banks.

HERB.: *Ballard* 212, Jordan, Scott Co.

***Verbena urticaefolia* LINN.** Spec. 29 (1753).

Wats. and Coult., Gray's Man. 6 ed. 402; Britt., Fl. N. J. 194; Webb., Fl. Neb. 139; Upham, Fl. Minn. 103; Chap., Fl. S. St. 307; Mac., Fl. Can. I, 378; Brew. and Wats., Fl. Calif. I, 608; Cov., Fl. Ark. 211; Gray, Syn. Fl. II, 1, 335; Coult., Fl. Tex. 327.

North America: N. B., Q., Ont. to Owen Sound; S. to N. Eng. and Fla.; W. to Ark., Tex. and California; S. in Mexico and C. America.

Minn. valley: Throughout; common; banks of streams or lakes, woods and thickets.

HERB.: *Sheldon* 840, Sleepy Eye; *Sheldon* 1575, Lake Benton; *Sheldon* 1091, Springfield; *Ballard* 530, Cleary's lake, Scott Co.; *Ballard* 667, Waconia; *Taylor* 809, Glenwood; *Kassube* 174, Minneapolis; *Herrick* 216, Minneapolis; *Oestlund* 126, Minneapolis; *Sandberg* 419, Goodhue Co.; *Herb. Sheld.* 1650, Minneapolis; *Herb. Moyer* 172, Montevideo.

XCIV. LABIATAE. Mint Family.

Endlicher, *Gen. Pl.* 607 (1836-40); Lindl. *Veg. King.* 659 (1846)—*Lamiaceae*; Bentham and Hooker, *Gen. Plant.* II, 1160 (1876); Baillon, *Hist. Pl.* XI, 1 (1892).

Genera: 150 ±; cosmopolitan; 129 (*Baillon*).

Species: 3000 ±; particularly abundant in the Orient; 2-3 fossil in Recent rocks.

STACHYS LINN. Gen. 485 (1737).**Betonica** LINN. Gen. 476 (1737).**Galeopsis** MOENCH, Meth. 397 (1794).**Zietinia** GLEDIT. Syst. 184 (1765).**Trixago** MOENCH, l. c. 398 (1794).**Tetrahitum** HOFFM. and LINK, Fl. Port. 103 (1809).**Eriostomum** H. and L. l. c. 105 (1809).

Benth. and Hook., *Gen. Pl.* II, 1208; Durand, *Ind. Gen. Phan.* 328; Schenck, *Palaeophyt.* 778; Baillon, *Hist. Pl.* XI, 4.

Living species: 200 described; 175 reduced. Cosmopolitan; in tropical mts. Europe, 50; Russia, 20; Russian Europe, 6; North America, 16; S. Sts., 4; Rocky mts., 1; E. Sts., 4; California, 7; Pl. Wheel., 6; several Tex. and Mex. region; W. Tex., 4.

Fossil species: Interglacial at Mundesley, *S. palustris* Linn. (*Schenck.*).

Stachys aspera MICHX. Fl. N. Am. II, 4 (1803).*S. arvensis* WALT. Fl. Car. 162 (1788) not Linn.*S. hispida* PURSH, Fl. Am. II, 407 (1814).*S. palustris* var. *aspera* GRAY, Man. 5 ed. 358 (1867).

Wats. and Coult., Gray's Man. 6 ed. 422; Britt., Fl. N. J. 201; Upham, Fl. Minn. 106; Webb., Fl. Neb. 138; Chap., Fl. S. St. 326; Mac., Fl. Can. I, 391; Forbes and Hems., Fl. Sin. II, 301; Led., Fl. Ross. III, 214; Miyabe, Fl. Kur. 256 in var.; Cov., Fl. Ark. 213; Gray, Syn. Fl. II, 1, 387.

Japan, Corea, Saghalin, Kuriles, Kamtk.

North America: W. Ont. to N. Eng., N. J. and S. Car.; W. to Minn., Neb. and Ark. Mexico?, Oregon?.

Minn. valley: Forest district to Blue Earth Co.; infrequent; wet ground.

HERB.: *Holzinger* 169, Winona Co.; *Holzinger* 170, Winona; *Bailey* 14, Vermilion lake; *Kassube* 184, Minneapolis.

Stachys palustris LINN. Spec. 580 (1753).

Wats. and Coult., Gray's Man. 6 ed. 422; Britt., Fl. N. J. 201; Mac., Fl. Can. I, 390; Upham, Fl. Minn. 106; Coult., Fl. Colo. 299; Brew. and Wats., Fl. Calif. I, 606; Led., Fl. Ross. III, 414; Nym., Fl. Eur.; Hook., Fl. Gt. Brit. 325; Wats., King Exp. 237; Roth., Wheel. Exp. 224; Gray, Syn. Fl. II, 1, 387 and Suppl. Syn. II, 462; Hart., Fl. Scand. I, 90.

N. Europe to Caucasus mts.; Ural and Altai Siberia to the Himalayas.

North America: Newf. to Pac. and Oregon; N. to Ft. Franklin on the Mackenzie; S. to N. Eng. and N. J.; W. across Cont.; S. in Rocky mts. to Mexico.

Minn. valley: Throughout; common; edges of marshes.

HERB.: *Ballard* 365, Helena, Scott Co.; *Taylor* 582, Minnesota lake; *Taylor* 475, Janesville; *Taylor* 855, Glenwood;

Sheldon 864, Sleepy Eye; *Sheldon* 1122, Springfield; *Sheldon* 362, Madison Lake; *Sheldon* 762, Sleepy Eye; *Sheldon* 642, Waseca; *Leonard* 37, Minneapolis; *Holzinger* 168, Farmington; *Sandberg* 441, Goodhue Co.; *Sandberg* 442, Cannon Falls; *Roberts* 108, Spring Valley; *Herb. Moyer* 188, Montevideo.

PHYSOSTEGIA BENTH. Bot. Reg. t. 1289 (1836).

Benth. and Hook., *Gen. Pl.* II, 1204; Durand, *Ind. Gen. Phan.* 327; Baillon, *Hist. Pl.* XI, 45.

Living species: 3; N. America. Rocky mts., 1; S. Sts., 2; Canada, 2; E. Sts., 2; W. Tex., 2.

Physostegia virginiana (LINN.) BENTH. Bot. Reg. 1289 (1836).

Dracocephalum virginianum LINN. Spec. 594 (1753).

Prasium purpureum and *concinneum* WALT. Fl. Car. 166 (1788).

Dracocephalum lancifolium MOENCH, Meth. 410 (1794).

D. variegatum VENT. Hort. Cels. 44 (1800).

Wats. and Coult., Gray's Man. 6 ed. 419; Britt., Fl. N. J. 201; Mac., Fl. Can. I, 389; Upham, Fl. Minn. 105; Chap., Fl. S. St. 325; Cov., Fl. Ark. 213; Gray, Syn. Fl. II, 1, 383; Coult., Fl. Tex. 342.

North America: Q., Ont., Man. to 49° N. lat., Minn. and Dak.; S. to N. Y., N. J. and Fla.; W. to Miss., Ark. and Tex.

Minn. valley: S. and W. districts and N. E.; probably throughout; wet banks and edges of swamps.

HERB.: *Sheldon* 1253, Lake Benton; *Herrick* 230, Minneapolis; *Holzinger* 164, Winona Co.; *Oestlund* 139, Minneapolis; *Sandberg* 434, Goodhue Co.; *Herb. Moyer* 187, Montevideo.

BRUNELLA LINN. Gen. 177 (1737).

Prunella LINN. Gen. later eds. (1767 etc.).

Benth. and Hook., *Gen. Pl.* II, 1203; Durand, *Ind. Gen. Phan.* 327; Baillon, *Hist. Pl.* XI, 43.

Living species: 2-3; cosmopolitan; in tropical mts. N. America, 1.

Brunella vulgaris LINN. Spec. 837 (1753).

Wats. and Coult., Gray's Man. 6 ed. 419; Britt., Fl. N. J. 201; Upham, Fl. Minn. 105; Webb., Fl. Neb. 138; Chap., Fl. S. St. 322; Mac., Fl. Can. I, 388; Brew. and Wats., Fl. Calif. I, 604; Forbes and Hems., Fl. Sin. II, 299; Led., Fl. Ross. III, 392; Nym., Fl. Eur.; Hook., Fl. Gt. Brit. 323; Miyabe, Fl. Kur. 255; Wats., Fl. Calif. II, 477; Roth., Wheel. Exp. 223; Wats., King Exp. 236; Cov., Fl. Ark. 212; Gray, Syn. Fl. II, 1, 382; Hart., Fl. Scand. I, 87.

N. Africa; Australia; Europe to Baikal Sib., Kuriles and China; Andes mts., S. America.

North America: Atl. to Pac. and Alaska; S. to Yosemite valley; S. to Neb., Minn., Ark., N. J., Fla., Tex. and Mexican mts.

Minn. valley: Forest district; infrequent; woods and thickets.

HERB.: *Ballard* 364, Helena, Scott Co.; *Bailey* 188, Vermilion lake; *Oestlund* 140, Hennepin Co.; *Roberts* 106, Duluth; *Sandberg* 435, Goodhue Co.; *Sheldon* 1627, Taylor's Falls.

SCUTELLARIA LINN. Gen. 493 (1737).

Cassida MOENCH, Meth. 413 (1794).

Benth. and Hook., *Gen. Pl.* II, 1201; Durand, *Ind. Gen. Phan.* 327; Baillon, *Hist. Pl.* XI, 42.

Living species: 100±; cosmopolitan; in tropical mts. Europe, 11; Russia, 15; European Russia, 4; North America, 23; S. Sts., 13; Rocky mts., 3; Canada, 5; E. Sts., 11; California, 7-8; Pl. Wheel., 3; Pl. King, 2; W. Tex., 8.

Scutellaria parvula MICHX. Fl. N. Am. II, 12 (1803).

S. ambigua NUTT. Gen. II, 37 (1818).

Wats. and Coult., Gray's Man. 6 ed. 418; Webb., Fl. Neb. 138; Chap., Fl. S. St. 324; Mac., Fl. Can. I, 388; Upham, Fl. Minn. 105; Gray, Syn. Fl. II, 380; Mac., Fl. Can. I, 574; Cov., Fl. Ark. 212; Coult., Fl. Tex. 342.

North America: Q., N. S., Ont. to Georgian bay and Saskatchewan; S. to N. Eng. and Fla.; W. to Minn., Neb., Ark. and Tex.

Minn. valley: Throughout; frequent; dry banks and edges of thickets.

HERB.: *Sheldon* 1345, Verdi, Lincoln Co.; *Sheldon* 1050, Iberia, Brown Co.; *Sheldon* 1540, Lake Benton; *Sheldon* 953, Redwood Falls; *Sheldon* 1066, Springfield; *Taylor* 181, Janesville; *Sandberg* 436, *Sandberg* 437, Goodhue Co.; *Holzinger* 165, Winona Co.; *Kassube* 182, Minneapolis; *Herb. Sheld.* 1767, Ft. Snelling.

Scutellaria galericulata LINN. Spec. 599 (1753).

Wats. and Coult., Gray's Man. 6 ed. 418; Britt., Fl. N. J. 201; Upham, Fl. Minn. 106; Mac., Fl. Can. I, 388; Coult., Fl. Colo. 298; Brew. and Wats., Fl. Calif. I, 603; Chap., Fl. S. St. 324; Forbes and Hems., Fl. Sin. II, 294; Led., Fl. Ross. III, 398; Hook., Fl. Gt. Brit. 324; Nym., Fl. Eur.; Miyabe, Fl. Kur.; Herd., Fl. Eur. Russ. 102; Roth., Wheel. Exp. 223; Wats., King Exp. 237; Gray, Syn. Fl. II, 381; Hart., Fl. Scand. I, 86; Webb., Appx. Neb. 39.

W. Europe to Japan, Kamtk., China and Kuriles to Saghalin; N. Africa; Manchuria.

North America: Newf., Anticosti to Pac. and Ft.

Franklin on Mackenzie; S. to N. Eng., N. J. and N. Car.; W. to Mont., Colo. and Arizona.

Minn. valley: Throughout; common; wet places in woods and along banks.

HERB.: *Ballard* 730, Benton, Carver Co.; *Ballard* 793, Goose lake, Carver Co.; *Ballard* 665, Waconia; *Ballard* 438, Prior's lake, Scott Co.; *Taylor* 377, Janesville; *Sheldon* 1086, Springfield; *Taylor* 608, Minnesota lake; *Sheldon* 554, Waseca; *Sheldon* 715, Sleepy Eye; *Taylor* 1055, Glenwood; *Ballard* 586, Rice lake, Scott Co.; *Holzinger* 166, Winona Co.; *Herrick* 231, Minneapolis; *Sandberg* 438, Chisago Co.; *Roberts* 107, Little Marais; *Bailey* 76, Vermilion lake; *Herrick* 232, Minneapolis; *Oestlund* 141, Minneapolis; *Kassube* 183, Minneapolis; *Sheldon* 1256, Lake Benton.

Scutellaria lateriflora LINN. Spec. 598 (1753).

Wats. and Coult., Gray's Man. 6 ed. 418; Britt., Fl. N. J. 201; Webb., Fl. Neb. 138; Mac., Fl. Can. I, 338; Coult., Fl. Colo. 298; Upham, Fl. Minn. 106; Chap., Fl. S. St. 324; Brew. and Wats., Fl. Calif. I, 602; Cov., Fl. Ark. 212; Gray, Syn. Fl. II, 1, 378.

North America: Newf., Anticosti, N. S. to Pac. and Oregon; N. to Athabasca; S. to N. Eng., N. J. and Fla.; W. to Minn., Neb., Ark., Miss., N. Mex. and Rockies.

Minn. valley: Throughout; common; wet, shaded banks.

HERB.: *Ballard* 710, Waconia; *Sheldon* 1212, New Ulm; *Taylor* 904, Glenwood; *Ballard* 820, Page lake, Carver Co.; *Taylor* 976, Glenwood; *Sheldon* 1037, Sleepy Eye; *Sandberg* 439, Goodhue Co.; *Holzinger* 167, Winona Co.; *Oestlund* 142, Minneapolis; *Herrick* 233, Minneapolis; *Bailey* 52, Vermilion lake; *Sandberg* 440, Cannon Falls; *Herb. Sheld.* 1672, Minneapolis.

DRACOCEPHALUM LINN. Gen. 481 (1737).

Moldavica MOENCH, Meth. 410 (1794).

Ruyschiana MILL. Dict. (1768).

Benth. and Hook., *Gen. Pl.* II, 1199; Durand, *Ind. Gen. Phan.* 326; Baillon, *Hist. Pl.* XI, 10 (*sub Nepeta*).

Living species: 30; Asia, 18; Europe, 4; N. America, 1.

Dracocephalum parviflorum NUTT. Gen. II, 35 (1818).

Wats. and Coult., Gray's Man. 6 ed. 416; Upham, Fl. Minn. 105; Coult., Fl. Colo. 298; Mac., Fl. Can. I, 387; Gray, Syn. Fl. II, 1, 378; Roth., Wheel. Exp. 223; Wats., King Exp. 236.

North America: Ont. to Pac., Ft. Franklin on the Mackenzie and Yukon river, Alaska; E. to N. Y.; S. to Minn. and Iowa; S. in Rockies to N. Mex.

Minn. valley: N. E. district and probably N. W.; dry places in woods or on gravelly banks.

HERB.: *Sandberg* 432, Tower; *Herrick* 228, Minneapolis; *Herrick* 229, Minneapolis; *Bailey* 53, Vermilion lake; *Sandberg* 433, Cannon Falls.

VLECKIA RAF. Med. Rep. II, V, 352 (1808).

Lophanthus BENTH. Bot. Reg. 1282 (1829) *not* Adans.

Benth. and Hook., *Gen. Pl.* II, 1198; Durand, *Ind. Gen. Phan.* 326; O. Kuntze, *Rev. Gen.* II, 511 (*sub Agastache*); Baillon, *Hist. Pl.* XI, 47.

Living species: 6; N. America and E. Asia; extra-tropical. N. America, 4; S. Sts., 2; Canada, 3; E. Sts., 3; Rocky mts., 2; Pac. coast, 1; Pl. King, 2; Pl. Wheel, 1; W. Tex., 1.

Vleckia foenicula (PURSH) RAF. N. Fl. (1836).

Stachys foeniculum PURSH, Fl. 407 (1814).

Hyssopus anisatus NUTT. Gen. II, 27 (1818).

H. discolor DESF. Cat. Par. (1829).

Lophanthus anisatus BENTH. Bot. Reg. 1282 (1829).

Wats. and Coult. Gray's Man. 6 ed. 415; Webb., Fl. Neb. 138; Coult., Fl. Colo. 298; Upham, Fl. Minn. 105; Mac., Fl. Can. I, 386; Brew. and Wats., Fl. Calif. I, 602; Wats., King. Exp. 236; Gray, Syn. Fl. II, 1, 376.

North America: Man., Athabasca, Saskatchewan to Ft. Franklin on Mackenzie; W. to Rockies; S. to Neb., Dak., Minn. and Wisc.

Minn. valley: Throughout; common; prairies and thickets.

HERB.: *Ballard* 453, Scott Co.; *Taylor* 774, Glenwood; *Ballard* 791, Swan Lake, Carver Co.; *Sheldon* 33, Sleepy Eye; *Herrick* 227, Minneapolis; *Bailey* 10a, Elk River; *Oestlund* 138, Minneapolis; *Watson* 1, Farmington; *Leonard* 36, Minneapolis; *Bailey* 49, Vermilion lake; *Kassube* 181, Minneapolis; *Sandberg* 431, Cannon Falls; *MacM.* and *Sheld.* 37, Brainerd; *Herb. Sheld.* 1644, Minneapolis; *Herb. Wickersheim* 97, Idlewild, Lincoln Co.; *Herb. Moyer* 186, Chippewa river, near Montevideo.

Vleckia scrophulariaefolia (WILLD.) RAF. N. Fl. (1836).

Hyssopus scrophulariaefolius WILLD. Spec. III, 48 (1800).

Lophanthus scrophulariaefolius BENTH. Bot. Reg. 1282 (1829).

Wats. and Coult., Gray's Man. 6 ed. 415; Britt., Fl. N. J. 200; Upham, Fl. Minn. 105; Chap., Fl. S. St. 321; Mac., Fl. Can. I, 386; Cov., Fl. Ark. 212; Gray, Syn. Fl. II, 1, 376.

North America: Ont. to Vt.; S. to N. J. and Ga.; W. to Minn., Neb., Ark. and Tex.

Minn. valley: Throughout; infrequent; borders of woods or thickets.

HERB.: *Sheldon 1319*, Lake Benton; *Ballard 713*, Waconia; *Sandberg 430*, Vasa.

Vleckia nepetoides (LINN.) RAF. N. Fl. (1836).

Hyssopus nepetoides LINN. Spec. 579 (1753).

Lophanthus nepetoides BENTH. Bot. Reg. 1282 (1829).

Wats. and Coult., Gray's Man. 6 ed. 415; Britt., Fl. N. J. 200; Upham, Fl. Minn. 105; Webb., Fl. Neb. 138; Chap., Fl. S. St. 321; Mac., Fl. Can. I, 386; Cov., Fl. Ark. 212; Gray, Syn. Fl. II, 1, 376; Coult., Fl. Tex. 340.

North America: Q., Ont. to Vt.; S. to N. Car.; W. to Minn., Neb., Ark. and Tex.

Minn. valley: W. district; infrequent; edges of woods or thickets.

HERB.: *Wickersheim 96*, Lake Park, Becker Co.

MONARDA LINN. Gen. 17 (1737).

Cheilyctis RAF. Journ. Phys. LXXXIX, 99 (1819).

Coryanthus NUTT. Trans. Am. Phil. Soc. V, 186 (1838).

Benth. and Hook., Gen. Pl. II, 1197; Durand, Ind. Gen. Phan. 326; Baillon, Hist. Pl. XI, 61.

Living species: 9; N. America. E. Sts., 6; Canada, 4; Rocky mts., 3; S. Sts., 4; Pl. Wheel., 2; W. Tex., 4.

Monarda punctata LINN. Spec. 22 (1753).

M. lutea MICHX. Fl. N. Am. I, 16 (1803).

Wats. and Coult., Gray's Man. 6 ed. 414; Britt., Fl. N. J. 199; Upham, Fl. Minn., 105; Mac., Fl. Can. I, 386; Coult., Fl. Colo. 297; Chap., Fl. S. St. 320; Cov., Fl. Ark. 212; Gray, Syn. Fl. II, 1, 375; Coult., Fl. Tex. 339.

North America: Ont.? to N. Y. and N. J.; S. to Fla. and Miss.; W. to Minn., Dak., Colo. and Tex.

Minn. valley: Central and S. central districts; infrequent; banks and thickets.

HERB.: *Scott 1*, Beaver.

Monarda fistulosa LINN. Spec. 22 (1753).

M. oblongata AIT. Hort. Kew. I, 36 (1789).

M. longifolia LAM. Enc. Meth. IV, 256 (1797).

M. allophylla MICHX. Fl. N. Am. II, 16 (1803).

M. involucrata WEND. Ind. Sem. Marb. (1807).

M. varians BART. Prodr. Penn. I, 34 (1815).

Wats. and Coult., Gray's Man. 6 ed. 414; Britt., Fl. N. J. 199; Upham, Fl. Minn. 104; Webb., Fl. Neb. 139; Mac., Fl. Can. I, 385; Coult., Fl. Colo. 297; Chap., Fl. S. St. 320; Roth., Wheel. Exp. 222; Cov., Fl. Ark. 212; Gray, Syn. Fl. II, 1, 374; Coult., Fl. Tex. 339.

North America: St. Lawrence river to Brit. Col.; S. to N. Eng., N. J. and Fla.; W. to Dak., Neb. and Tex.

Minn. valley: Throughout; common; borders of woods and thickets.

HERB.: *Sheldon* 1185, New Ulm; *Taylor* 772, Glenwood; *Ballard* 871, Waconia; *Sheldon* 1334, Lake Benton; *Ballard* 617, Chaska; *Ballard* 573, Prior's lake, Scott Co.; *Kassube* 180, Minneapolis; *Oestlund* 137, Hennepin Co.; *Winchell* 17, Minneapolis; *Leonard* 35, Minneapolis; *Sandberg* 429, Cannon Falls, var. *mollis* Benth.; *Taylor* 880, Glenwood; *Herb. Sheld.* 1665, Minneapolis; *Herb. Moyer* 184, 185, Chippewa river, near Montevideo.

HEDEOMA PERS. Syn. II, 131 (1807).

Benth. and Hook., *Gen. Pl.* II, 1188; Durand, *Ind. Gen. Phan.* 325; Baillon, *Hist. Pl.* XI, 56.

Living species: 12; N. and S. America; N. America, 10; Canada, 2; S. Sts., 2; E. Sts., 3; Pl. Wheel., 2; several in Texas and Mexico; W. Tex., 6.

Hedeoma hispida PURSH, Fl. Am. 414 (1814).

H. hirta NUTT. Gen. I, 16 (1818).

Cunila hispida SPRENG. Syst. I, 54 (1825).

Wats. and Coult., Gray's Man. 6 ed. 412; Webb., Fl. Neb. 139; Mac., Fl. Can. I, 385; Upham, Fl. Minn. 104; Coult., Fl. Colo. 296; Cov., Fl. Ark. 211; Gray, Syn. Fl. II, 1, 362.

North America: Ont. to Saskatchewan; S. to Dak., Neb., Minn., Ill., Ark. and La.

Minn. valley: Throughout; dry knolls and headlands or ledges of rock.

HERB.: *Sheldon* 1449, Pipestone; *Sheldon* 819, Sleepy Eye; *Oestlund* 136, Minneapolis; *Sandberg* 428, Cannon Falls; *Herrick* 226, Minneapolis; *Kassube* 179, Minneapolis; *Herb. Moyer* 183, Montevideo.

ACINOS MOENCH, Meth. 407 (1794).

Calamintha MOENCH, l. c. 408 (1794).

Clinopodium LINN. em. Benth. l. c. 1191 (1876). ●

Benth. and Hook., *Gen. Pl.* II, 1190; Durand, *Ind. Gen. Phan.* 325; O. Kuntze, *Rev. Gen.* 513; Baillon, *Hist. Pl.* XI, 55.

Living species: 40; temperate N. hemisphere; Russia, 17; Europe, 9; Russian Europe, 3; S. Sts., 6; Rocky mts., 1; Canada, 2; E. Sts., 3; California, 2; W. Tex., 1.

Acinos vulgaris (LINN.).

Clinopodium vulgare LINN. Spec. 821 (1753).

Calamintha clinopodium SPENN. Fl. Frib. III (1829).

Wats. and Coult., Gray's Man. 6 ed. 412; Britt., Fl. N. J. 198; Upham, Fl. Minn. 104; Mac., Fl. Can. I, 384; Coult., Fl. Colo. 296; Herd., Fl. Eur. Russ. 102; Cov., Fl. Ark. 211; Forbes and Hems., Fl. Sin. II, 283 (closely related spec.); Gray, Syn. Fl. II, 1, 360; Hart., Fl. Scand. I, 86.

Northern Europe to Asia, Corea? Formosa? Japan? Manchuria?

North America: Ont. to Rocky mts.; S. to Gt. Lakes; introduced from W. Europe further E. in U. S.

Minn. valley: Reported from N. edge; rare or doubtful; borders of woods and fields.

HERB.: *Bailey 59*, Vermilion lake.

KOELLIA MOENCH, Meth. 407 (1794).

Pycnanthemum MICHX. Fl. N. Am. II, 7 (1803).

Brachystemum MICHX. l. c. 5 (1803).

Tullia LEAVENW. Sill. Journ. XX, 343 (1831).

Benth. and Hook., *Gen. Pl.* II, 1184; Durand, *Ind. Gen. Phan.* 325; O. Kuntze, *Rev. Gen.* 520; Baillon, *Hist. Pl.* XI, 51.

Living species: 17; N. America. California, 1; rest E. and S. S. Sts., 10; E. Sts., 10; Canada, 4; Rocky mts., 1; W. Tex., 2; 13 (*Gray Syn. Fl.*) N. America.

Koellia flexuosa (WALT.).

Nepeta flexuosa WALT. Fl. Car. (1788).

? *Koellia capitata* MOENCH, Meth. (1794).

Brachystemum lanceolatum WILLD. Enum. 623 (1809) *in part*.

Pycnanthemum linifolium PURSH, Fl. Am. 409 (1814).

P. flexuosum B. S. P. Cat. N. Y. (1888).

Wats. and Coult., *Gray's Man.* 6 ed. 410; Upham, *Fl. Minn.* 104; Britt., *Fl. N. J.* 198; Chap., *Fl. S. St.* 315; Mac., *Fl. Can.* I, 574; Cov., *Fl. Ark.* 211; *Gray, Syn. Fl.* II, 1, 354; Coult., *Fl. Tex.* 334.

North America: Ont. to Mass. and Minn.; S. to N. J., Fla., Ark. and Tex.

Minn. valley: Reported from S. central district; dry woods or thickets.

Koellia virginiana (LINN.) OK. *Rev. Gen.* II, 520 (1891).

Satureja virginiana LINN. Spec. 567 (1753).

Thymus virginicus LINN. Mant. 409 (1767).

? *Koellia capitata* MOENCH, Meth. (1794).

Nepeta virginica WILLD. Spec. III, 56 (1800).

Pycnanthemum virginicum PERS. *Syn.* II, 128 (1807).

Brachystemum lanceolatum WILLD. Enum. 623 (1809) *in part*.

Pycnanthemum lanceolatum PURSH, Fl. Am. 409 (1814).

P. virginianum HITCHCOCK, Fl. Ames. 512 (1891).

Wats. and Coult., *Gray's Man.* 6 ed. 409; Britt., *Fl. N. J.* 198; Webb., *Fl. Neb.* 139; Chap., *Fl. S. St.* 315; Mac., *Fl. Can.* I, 382; Coult., *Fl. Colo.* 295; *Gray, Syn. Fl.* II, 1, 354; Cov., *Fl. Ark.* 211.

North America: Q., Ont., N. Eng. to N. J. and Ga.; W. to Minn., Dak., Neb. and Ark.

Minn. valley: Throughout; edges of woods or thickets.

HERB.: *Ballard* 626, Chaska; *Taylor* 474, Janesville; *Sheldon* 772, Sleepy Eye; *Taylor* 782, Glenwood; *Winchell* 16, Cedar lake. Hennepin Co.; *Oestlund* 135, Minneapolis; *Sandberg* 427, Goodhue Co.; *Herb. Sheld.* 1661, Minneapolis; *Herb. Moyer* 182, Montevideo.

LYCOPUS LINN. Gen. 19 (1737).

Benth. and Hook., *Gen. Pl.* II, 1183; Durand, *Ind. Gen. Phan.* 324; Schenck, *Palaeophyt.* 778; Baillon, *Hist. Pl.* XI, 49.

Living species: 10 described; perhaps only 2-3 distinct; temperate regions of old world and N. America. Europe, 2; Russia, 3; N. America, 5; E. Sts., 5; Rocky mts., 3; California, 2; Canada, 3; S. Sts., 3; Pl. Wheel., 2; Pl. King, 1; W. Tex., 1.

Fossil species: Interglacial at Beeston, *L. europaeus* Linn. (*Schenck*).

***Lycopus sinuatus* ELL.** Sk. I, 187 (1821).

L. europaeus WALT. Fl. Car. (1788).

L. vulgaris and *angustifolius* NUTT. Gen. II, (1818).

L. europaeus var. *sinuatus* GRAY, Man. 5 ed. 346 (1867).

Wats. and Coult., Gray's Man. 6 ed. 408; Britt., Fl. N. J. 196; Brew. and Wats., Fl. Calif. I, 592; Coult., Fl. Colo. 295; Mac., Fl. Can. I, 382; Webb., Fl. Neb. 139; Chap., Fl. S. St. 313; Upham, Fl. Minn. 104; Roth., Wheel. Exp. 221; Wats., King. Exp. 234; Cov., Fl. Ark. 211; Gray, Syn. Fl. II, 1, 353; Coult., Fl. Tex. 334.

North America: Atl. to Pac. in Can.; N. to Peace river; S. to Oregon and Calif. and throughout E. U. S. to Fla. and Tex.

Minn. valley: Throughout; wet places along streams and in woods.

HERB.: *Ballard* 687, Waconia; *Ballard* 785, Swan lake, Carver Co.; *Sheldon* 897, Sleepy Eye; *Sheldon* 1543, Lake Benton; *Ballard* 720, Benton, Carver Co.; *Roberts* 105, Baptism river; *Oestlund* 104, Minneapolis; *Sandberg* 426, Cannon Falls; *Holzinger* 163, Winona Co.; *Herrick* 225, Minneapolis; *Herb. Sheld.* 1660, Minneapolis; *Herb. Wickersheim* 95, Idlewild, Lincoln Co.; *Herb. Moyer* 181, Montevideo.

***Lycopus lucidus* TURCZ. var. *obtusifolius* (BENTH).**

L. obtusifolius BENTH. DC. Prodr. XII, 177 (1848).

L. lucidus var. *americanus* GRAY, Proc. Am. Acad. VIII, 286 (1870).

Wats. and Coult., Gray's Man. 6 ed. 408; Webb., Fl. Neb. 139; Upham, Fl. Minn. 104; Mac., Fl. Can. I, 382; Coult., Fl. Colo. 205; Brew. and Wats., Fl. Calif. I, 592; Forbes and Hems., Fl. Sin. II, 282 (spec.); Roth., Wheel. Exp. 221; Gray, Syn. Fl. II, 1, 353.

Species ranges in Japan, Siberia and Manchuria to China proper.

North America: Hudson Bay and Saskatchewan to Calif., Arizona, N. Mex., Ark. and Neb.

Minn. valley: N. W. to W. and S. central district; wet places.

HERB: *Taylor 1054*, Glenwood; *Sheldon 1544*, Lake Benton; *Taylor 1008*, Glenwood.

Lycopus rubellus MOENCH, Meth. Suppl. 446 (1802).

L. angustifolius NUTT. Gen. I, 15 (1818).

L. europaeus var. *integrifolius* GRAY, Man. 5 ed. (1867).

Wats. and Coult., Gray's Man. 6 ed. 408; Britt., Fl. N. J. 196; Upham, Fl. Minn. 104; Cov., Fl. Ark. 211; Gray, Syn. Fl. II, 1, 353.

North America: N. J. to Minn.; S. to Ga. and Tenn.; W. to La. and Ark.

Minn. valley: N. E. district; rare; wet places in woods or along banks.

Lycopus virginicus LINN. Spec. 21 (1753).

L. uniflorus MICHX. Fl. N. Am. I, 14 (1803).

L. pumilus VAHL, Enum. (1806).

Wats. and Coult., Gray's Man. 6 ed. 408; Britt., Fl. N. J. 196; Coult., Fl. Colo. 294; Upham, Fl. Minn. 104; Webb., Fl. Neb. 139; Mac., Fl. Can. I, 382; Chap., Fl. S. St. 313; Brew. and Wats., Fl. Calif. I, 592; Cov., Fl. Ark. 211; Gray, Syn. Fl. II, 1, 353.

North America: Labrador across Can. in forest reg. to Oregon and Brit. Col.; S. to Neb., Ark., Mo. and Fla.

Minn. valley: Forest district, particularly N. E.; wet places in woods or along streams.

HERB.: *Ballard 796*, Goose lake, Carver Co.; *Roberts 102*, Grand Marais; *Oestlund 133*, Hennepin Co.; *Roberts 103*, Knife river; *Roberts 104*, Baptism river; *Sandberg 425*, Cannon Falls; *Herb. Moyer 261*, Montevideo.

MENTHA LINN. Gen. 478 (1737).

Menthella PERARD, ex Durand l. c. (1888).

Pulegium MILL, Dict. No. 8 (1768).

Audibertia BENTH. Bot. Reg. 1282 (1829).

Benth. and Hook., Gen. Pl. II, 1182; Durand, Ind. Gen. Phan. 324; Baillon, Hist. Pl. XI, 48.

Living species: 300±, described; perhaps only 20-25 distinct. All temperate and tropical regions. Russia, 9; Europe, 13; Russian Europe, 7; N. America, 1 end.

Mentha canadensis LINN. Spec. 577 (1753).

Wats. and Coult., Gray's Man. 6 ed. 408; Britt., Fl. N. J. 196; Coult., Fl. Colo. 294; Upham, Fl. Minn. 104; Webb., Fl. Neb. 139; Brew. and

Wats., Fl. Calif. I, 591; Mac., Fl. Can. I, 381; Roth., Wheel. Exp. 221, 372; Wats., King. Exp. 234; Cov., Fl. Ark. 211; Gray, Syn. Fl. II, 1, 352.

A very close species (*M. arvensis*) in China, W. Eur. and Java.

North America: Puget Sound to Mackenzie reg. and Atl. coast in Can.; S. throughout continent; rarer southward.

Minn valley: Throughout; common; wet places in woods or along streams.

HERB.: *Ballard* 719, Benton, Carver Co.; *Ballard* 505, Prior's lake, Scott Co.; *Taylor* 167a, Janesville; *Ballard* 615, Chaska; *Sheldon* 1296, Lake Benton; *Ballard* 669, Waconia; *Ballard* 819, Page lake, Carver Co.; *Taylor* 1004, Glenwood; *Ballard* 777, Swan lake, Carver Co.; *Sheldon* 865, Sleepy Eye; *Sheldon* 1084, Springfield; *Sheldon* 179, Eagle lake, Blue Earth Co.; *Sheldon* 21, Elysian; *Taylor* 677, Minnesota lake; *Sheldon* 751, Sleepy Eye; *Herrick* 221, Minneapolis; *Kassube* 178, Minneapolis; *Holzinger* 162, Winona Co.; *Herrick* 222, Minneapolis; *Bailey* 3, Vermilion lake; *Roberts* 101, Grand Marais; *Herrick* 224, Minneapolis; *Sandberg* 424, Cannon Falls; *Herb. Wickersheim* 94, Ash lake, Lincoln Co.; *Herb. Moyer* 180, Montevideo.

TEUCRIUM LINN. Gen. 467 (1737).

Leucosceptrum SM. Ex. Bot. II, 113 (1805).

Polidendron NOE, Webb, Phyt. Car. III, 106 (1847).

Scorodonia MOENCH, Meth. 384 (1794).

Scordium CAV. Ic. I, 19 (1791).

Chamaedrys MOENCH, Meth. 383 (1794).

Polium MOENCH, Meth. 385 (1794).

Benth. and Hook., *Gen. Pl.* II, 1221; Durand, *Ind. Gen. Phan.* 330; Baillon, *Hist. Pl.* XI, 75.

Living species: 100±; cosmopolitan except in subarctic and antarctic regions. Europe, 50; Russia, 9; N. America, 4; S. Sts., 1; E. Sts., 2; Canada, 2; Rocky mts., 2; California, 2; Pl. Wheel., 1; W. Tex., 4.

Teucrium canadense LINN. Spec. 564 (1753).

T. virginicum LINN. Spec. 564 (1753) Pl. Gronov.

Wats. and Coult., *Gray's Man.* 6 ed. 406; Britt, Fl. N. J. 203; Upham, Fl. Minn. 103; Mac., Fl. Can. I, 380; II, 349; Webb., Fl. Neb. 138; Chap., Fl. S. St. 328; Led., Fl. Ross. III, 446; Roth., Wheel. Exp. 225; Cov., Fl. Ark. 213; Gray, Syn. Fl. II, 1, 349; Coult., Fl. Tex. 333.

Altai Siberia?

North America: N. B., N. S., Q., Ont. to N. Eng., N. J. and Fla.; W. to Minn., Neb., Ark., Tex. and Mex.

Minn. valley: Throughout; low banks and edges of thickets.

HERB.: *Sheldon* 1542, Lake Benton; *Ballard* 463, Prior's lake, Scott Co.; *Taylor* 982, Glenwood; *Taylor* 678, Minnesota lake; *Oestlund* 132, Minneapolis; *Holzinger* 160, Winona Co.; *Herrick* 220, Minneapolis; *Holzinger* 161, Winona; *Herb. Moyer* 178, 179, Montevideo.

ISANTHUS MICHX. Fl. Bor.-Am. II, 3, t. 30 (1803).

Benth. and Hook., *Gen. Pl.* II, 1220; Durand, *Ind. Gen. Phan.* 330; Baillon, *Hist. Pl.* XI, 76.

Living species: 1, N. America.

Isanthus brachiatus (LINN.) B. S. P. Cat. N. Y. (1888).

Trichostema brachiatus LINN. Spec. 834 (1753).

Isanthus caeruleus MICHX. Fl. N. Am. II, 30 (1803).

Wats. and Coult., *Gray's Man.* 6 ed. 406; Britt., *Fl. N. J.* 203; Upham, *Fl. Minn.* 103; Mac., *Fl. Can.* I, 379; Chap., *Fl. S. St.* 327; Cov., *Fl. Ark.* 213; Gray, *Syn. Fl.* II, 1, 349; Coult., *Fl. Tex.* 332.

North America: Q., Ont. to N. Eng., N. J., Tenn. and N. Car.; W. to Minn., Ill., Mo. and Ark.

Minn. valley: Forest district to Blue Earth Co.; infrequent; banks and sandy fields.

XCV. SOLANACEAE. Nightshade Family.

Endlicher, *Gen. Pl.* 662 (1836-40); Bentham and Hooker, *Genera Plant.* II, 882 (1876); Baillon, *Hist. Pl.* IX, 281 (1888); v. Wettstein in *Engler and Prantl, Nat. Pflanz.* IV, 3 b, 4 (1891).

Genera: 75; tropical and temperate regions; center in C. and S. America. N. America, 18 gen.; Europe, 10; Asia, 15 (v. Wettst.).

Species: 1500±, many doubtfully of sp. rank; 1-2 fossil, very doubtful, *Solanites*.

PHYSALIS LINN. Gen. 144 (1737).

Pentaptilum REICH. Nomencl. 4571 (1841).

Baillon, *Hist. Pl.* IX, 330; Benth. and Hook., *Gen. Pl.* II, 890; Durand, *Ind. Gen. Phan.* 287; Engler and Prantl, *Nat. Pflanz.* IV, 3 b, 19 (von Wettstein).

Living species: 45; warmer regions of the earth; especially in N. and S. America. Europe, 2; Russia, 1; Japan, 3; Africa, S. Asia and Australia, 1; N. America, 18; Rocky mts., 6-7; California and L. Calif., 6; S. Sts., 5; E. Sts., 7-8; Canada, 4; Pl. King, 1; Pl. Wheel., 2; W. Tex., 12.

Physalis lanceolata MICHX. Fl. N. Am. I, 149 (1803).

P. pumila NUTT. Trans. Phil. Soc. VII, 193 (1841).

P. pennsylvanica GRAY, *Man.* 5 ed. 382 (1867).

Wats. and Coult., *Gray's Man.* 6 ed. 375; Webb., *Fl. Neb.* 136; Mac.,

Fl. Can. I, 350; Upham, Fl. Minn. 111; Coult., Fl. Colo. 270; Cov., Fl. Ark. 207; Gray, Syn. Fl. II, 1, 236; Coult., Fl. Tex. 301.

North America: Ont. to S. Man.; S. to N. Y. and Fla.; W. to Minn., Dak., Colo., Utah, N. Mex. and Tex.

Minn. valley: Throughout; abundant; waste places.

HERB.: *Sheldon* 1471, Pipestone City; *Ballard* 468, Prior's lake, Scott Co.; *Taylor* 858, Glenwood; *Ballard* 180, Jordan, Scott Co.; *Ballard* 269, Jordan, Scott Co.; *Oestlund* 146, Hennepin Co.; *Kassube* 199, Minneapolis; *Leiberg* 52, Blue Earth Co.; *Holzinger* 184, Dakota Co.; *Herrick* 247, Minneapolis; *Gedge* 10, Detroit; *Hammond* 32, Lake City; *Herb. Sheld.* 1805, Minneapolis.

***Physalis virginiana* MILL.** Dict. ed. 8, No. 4 (1768).

P. nyctaginea DUNAL, DC. Prodr. XIII, 450 (1849).

P. viscosa GRAY, Man. 5 ed. 382 (1867).

Wats. and Coult., Gray's Man. 6 ed. 375; Britt., Fl. N. J. 182; Webb., Fl. Neb. 136; Upham, Fl. Minn. 111; Mac., Fl. Can. I, 349; Chap., Fl. S. St. 350; Coult., Fl. Colo. 270; Cov., Fl. Ark. 207; Gray, Syn. Fl. II, 1, 235; Coult., Fl. Tex. 300.

North America: W. Ont. to L. Huron reg., Minn., Neb., Dak. and Colo.; S. to N. J. and Fla., Ark. and Tex.

Minn. valley: Throughout; common; waste places.

HERB.: *Ballard* 269, Jordan, Scott Co.; *Sheldon* 255, Turtle lake, Le Sueur Co.; *Ballard* 375, Helena, Scott Co.; *Sheldon* 1504, Lake Benton; *Sheldon* 911, Sleepy Eye; *Huntington* 12, Rock Co.; *Kassube* 198, Minneapolis; *Holzinger* 182, Tracy, Lyon Co.; *Holzinger* 183, Winona Co.; *Herb. Sheld.* 1750, Minneapolis.

***Physalis pubescens* LINN.** Spec. 262 (1753).

P. pruinosa LINN. Spec. 263 (1753).

P. obscura var. *viscido-pubescens* MICHX. Fl. N. Am. I, 149 (1803).

P. viscosa ELL. Sk. I, 279 (1821).

P. hirsuta DUNAL, DC. Prodr. XIII, 450 (1849).

Wats. and Coult., Gray's Man. 6 ed. 375; Britt., Fl. N. J. 182; Upham, Fl. Minn. 111; Webb., Fl. Neb. 136; Brew. and Wats., Fl. Calif. I, 541; Coult. Fl. Colo., 270; Chap., Fl. S. St. 351; Mac., Fl. Can. I, 349; Forbes and Hems., Fl. Sin. II, 174; Griseb., Fl. W. I.; Wats., King Exp. 274; Cov., Fl. Ark. 207; Gray, Syn. Fl. II, 1, 234; Engl. v. Wetts., Nat. Pflanz. IV, 3 b, 19; Coult., Fl. Tex. 300.

China; Barbadoes; Brazil and tropical America.

North America: N. Br. to Brit. Col.; S. to Calif., Colo., Tex. and Fla.

Minn. valley: S. E. and C. districts; to New Ulm and the Lac Qui Parle valley; low, damp soil.

Physalis angulata LINN. Spec. 262 (1753).

Wats. and Coult., Gray's Man. 6 ed. 375; Britt., Fl. N. J. 181; Webb., Fl. Neb. 136; Upham, Fl. Minn. 111; Coult., Fl. Colo. 269; Chap., Fl. S. St. 351; Cov., Fl. Ark. 207; Gray, Syn. Fl. II, 1, 234; Coult., Fl. Tex. 300.

North America: N. J. to Minn. and Neb.; S. to Tex. and Fla. "Widely diffused in the tropics" (*Gray*).

Minn. valley: N. E. district; infrequent; waste places.

Physalis philadelphica LAM. Enc. Meth. II, 101 (1786).

P. chenopodifolia WILLD. Spec. I, 1023 (1797).

Wats. and Coult., Gray's Man. 6 ed. 375; Britt., Fl. N. J. 181; Upham, Fl. Minn. 111; Cov., Fl. Ark. 207; Gray, Syn. Fl. II, 1, 234; Engl. v. Wetts., Nat. Pflanz. IV, 3 b, 19; Coult., Fl. Tex. 300.

North America: N. J. to Minn.; S. to Ill., Ark. and Texas.

Minn. valley: S. central district; Blue Earth valley to Redwood valley; low rich ground in thickets.

Physalis grandiflora HOOK. Fl. Bor. Am. II, 90 (1840).

Wats. and Coult., Gray's Man. 6 ed. 375; Mac., Fl. Can. I, 349; Upham, Fl. Minn. 111; Gray, Syn. Fl. II, 1, 233.

North America: St. Lawrence river to L. Champlain; W. to Man. and Saskatchewan; S. to Minn.

Minn. valley: N. edge; local or rare; clearings and waste in forest.

HERB.: *Bailey* 242, Vermilion lake.

SOLANUM LINN. Gen. 145 (1737).

Aquartia LINN. Gen. ed. VI, 136 (1764).

Normania LOWE, Man. Fl. Mader. II, 70 (1868).

Cliocarpus MIERS. Ann. Nat. Hist. 2, IV, 141 (1859).

Nycterium VENT. Jard. Malm. t. 85 (1804).

Androcera NUTT. Gen. I, 129 (1818).

Melogona TOURN. Inst. 151 (1700).

Pseudocapsicum MOENCH, Meth. 476 (1794).

Dulcamara MOENCH, l. c. 514 (1794).

Ceranthra MOENCH, Monthl. Mag. (1819).

Cyphomanera SENDT. Flora, 162 (1845).

Pionandra MIERS. Hook. Lond. Journ. IV, 353 (1845).

Cyathostyles SCHOTT. ex Meiss. Gen. Com. 184 (1843).

Pallavicinia DENOT. Flora, 162 (1847).

Lycopersicum DUNAL, Solan. t. 3, fig. 3 (1816).

Psolanum NECK. Elem. 708 (1790).

Baillon, *Hist. Pl.* IX, 327; Benth. and Hook., *Gen. Pl.* II, 888, 889; Durand, *Ind. Gen. Phan.* 287; Engler and Prantl, *Nat. Pflanz.* IV, 3 b, 21 (von Wettstein); Schenck, *Palaeophyt.* 777.

Living species: 1000+ described; 950 distinct; tropical and subtropical regions; extra tropical north rather than south. Europe, 9; Russia, 8; Russian Europe, 5; N. America,

15; Rocky mts., 5; S. Sts., 10; California, 5; E. Sts., 6; Pl. Wheel., 6; Canada, 3; Pl. King, 2; W. Tex. 11.

Fossil species: *Solanites*, Oligocene—Aix (*Saporta*).

***Solanum nigrum* LINN.** Spec. 266 (1753).

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|------------------------------|---|------------------------------|
| <i>S. pterocaulon</i> | } | DC. Prodr. XIII, 359 (1852). |
| <i>S. crenato - dentatum</i> | | |
| <i>S. ptycanthum</i> | | |

Wats. and Coult., Gray's Man. 6 ed. 374; Britt., Fl. N. J. 181; Upham, Fl. Minn. 111; Mac., Fl. Can. I, 348; Chap., Fl. S. St. 348; Webb., Fl. Neb. 136; Coult., Fl. Colo. 268; Brew. and Wats., Fl. Calif. I, 538; Forbes and Hems., Fl. Sin. II, 171; Hook., Fl. Gt. Brit. 287; Led., Fl. Ross. III, 188; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 94; Wats., King Exp. 274; Roth., Wheel. Exp. 207; Cov., Fl. Ark. 207; Gray, Syn. Fl. II, 1, 227; Hart., Fl. Scand. I, 103; Engl. v. Wettst., Nat. Pflanz. IV, 3 b, 22; Coult., Fl. Tex. 297.

Cosmopolitan, temperate and tropical regions.

North America: Throughout, except far north.

Minn. valley: Throughout; common; low damp and rich soil; shaded places.

HERB.: *Taylor* 903, Glenwood; *Ballard* 494, Prior's lake, Scott Co.; *Ballard* 778, Swan lake, Carver Co.; *Sheldon* 1013, Sleepy Eye; *Holzinger* 180, Winona Co.; *Sandberg* 459, Cannon Falls; *Holzinger* 181, Winona; *Kassube* 197, Minneapolis; *Herrick* 246, Minneapolis; *Herb. Sheld.* 1744, Minneapolis; *Herb. Sheld.* 1673, Ft. Snelling; *Herb. Wickersheim* 105, Ash lake, Lincoln Co.

XCVI. SCROPHULARIACEAE. Figwort Family.

Endlicher, *Gen. Pl.* 670; DC., Prodr. X, 187 (1846)—*Personatae*, *Antirrhineae*, *Rhinanthaceae*; Bentham and Hooker, *Gen. Plant.* II, 913 (1876); Baillon, *Hist. Pl.* IX, 413 (1888.; v. Wettstein in *Engler and Prantl*, *Nat. Pflanz.* IV, 3 b, 39 (1891).

Genera: 150±, temperate and tropical regions. N. America, 38 gen., 380 spec.; Europe, 30 gen., 430 spec. (v. Wettst.).

Species: 2100±; 3-4 fossil, doubtful.

SCROPHULARIA LINN. Gen. 494 (1737).

***Ceremanthe* REICH.** Sax. Fl. 230 (1842).

Benth. and Hook., *Gen. Pl.* II, 937; Durand, *Ind. Gen. Phan.* 293; Bailon, *Hist. Pl.* IX, 430; Engler and Prantl, *Nat. Pflanz.* IV, 3 b, 65; Schenck, *Palaeophyt.* 778.

Living species: 114; extra-tropical regions of N. hemisphere; especially abundant in the Mediterranean region.

Europe, 40; Russia, 21; Russian Europe, 9; N. America, 3; Canada, 3; N. Mexico, 1; California, 1; Pl. Wheel., 2.

Fossil species: *Scrofularina*, 1, Miocene of Oeningen (Heer).

Scrophularia nodosa LINN. var. **marylandica** (LINN.) GRAY, Syn. Fl. II, 1, 258 (1886).

S. marylandica LINN. Spec. 863 (1753).

S. lanceolata PURSH, Fl. Am. 419 (1814).

Wats. and Coult., Gray's Man. 6 ed. 380; Britt., Fl. N. J. 184; Upham, Fl. Minn. 99; Webb., Fl. Neb. 137; Chap., Fl. S. St. 289; Coult., Fl. Colo. 273; Mac., Fl. Can. I, 354; II, 346; Brew. and Wats., Fl. Calif. I, 552; Hook., Fl. Gt. Brit. (spec.) 290; Led., Fl. Ross. (spec.) III, 218; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. (spec.) 94; Cov. Fl. Ark. 207; Hart., Fl. Scand. I, 106 (spec.); Engler, v. Wetts., Nat. Pflanz. IV, 3 b, 65.

Species ranges through almost all Europe and Siberia.

North America: Q., Ont. to Minn. and Oregon; S. to N. Eng., N. J. and Fla.; W. to Minn., Colo., Neb., Utah.

Minn. valley: Throughout; frequent; thickets and gravelly banks of streams.

HERB.: *Ballard* 103, Shakopee; *Taylor* 588, Minnesota lake; *Sheldon* 974, Sleepy Eye; *Taylor* 123, Janesville; *Sheldon* 51, Elysian; *Sheldon* 128, Madison Lake; *Kassube* 160, Minneapolis; *Herrick* 196, Minneapolis; *Sandberg* 397, Cannon Falls; *Herb. Sheld.* 1904, Minneapolis; *Herb. Moyer* 162, Montevideo.

CHELONE LINN. Gen. 508 (1737).

Baillon, *Hist. Pl.* IX, 435; Benth. and Hook., *Gen. Pl.* II, 939; Durand, *Ind. Gen. Phan.* 293; Engler and Prantl, *Nat. Pflanz.* 4, 3 b, 65 (von Wettstein).

Living species: 4; N. America; 1 in California and Washington; E. Sts., 2; S. Sts., 3; Carolina, 1.

Chelone glabra LINN. Spec. 611 (1753).

C. alba PURSH, Fl. Am. 427 (1814).

Wats. and Coult., Gray's Man. 6 ed. 381; Britt., Fl. N. J. 184; Upham, Fl. Minn. 99; Chap., Fl. S. St. 289; Mac., Fl. Can. I, 354; Cov., Fl. Ark. 207; Gray, Syn. Fl. II, 1, 258; Engl. Wetts., Nat. Pflanz. IV, 3 b, 65.

North America: Newf., N. S., N. Br. to S. and W. Man.; S. to N. Eng., N. J. and Fla.; W. to Minn. and Ark.

Minn. valley: Forest district; swamps and marshes.

HERB.: *Herrick* 197, Minneapolis; *Winchell* 13, Duluth; *Bailey* 327, St. Louis river; *Holzinger* 144, Winona Co.; *Sandberg* 398, Red Wing; *Roberts* 95, Baptism river; *Herb. Sheld.* 1668, Minneapolis.

PENSTEMON MITCH. Act. Med. Cur. VIII, 214 (1748).

Pentstemon L'HER. ex Lamb. Linn. Trans. X, 6 (—).

Elmigera REICHB. Conspect. 123 (1828).

Lepidostemon LEME. Ill. Hort. 315 (1844).

Dasanthera RAF. Jour. Phys. LXXXIX, 99 (1819).

Baillon, *Hist. Pl.* IX, 435; Benth. and Hook., *Gen. Pl.* II, 940; Durand, *Ind. Gen. Phan.* 293; Engler and Prantl, *Nat. Pflanz.* IV, 3 b, 65 (von Wettstein) as *Pentastemon* Mitch.

Living species: 82–85; N. America, 70; a few in Mexico and N. Asia; Canada, 15; California, 35; E. Sts., 9; S. Sts., 3; Rocky mts., 27–30; Pl. King., 19; Pl. Wheel., 24; W. Tex., 15.

Penstemon acuminatus DOUGL. Hook., *Fl. Am.* II, 97 (1840).

P. nitidus DOUGL. ex Benth. DC. Prodr. X, 325 (1846).

P. fendleri GRAY, Pac. R. R. Rep. II, 168 (1855).

Wats. and Coult., Gray's Man. 6 ed. 382; Gray, Syn. *Fl.* II, 1, 263; Upham, *Fl. Minn.* 99; Coult., *Fl. Colo.* 275; Mac., *Fl. Can.* I, 355, 570; Brew. and Wats., *Fl. Calif.* I, 599; Coult., *Fl. Tex.* 308.

North America: Minn. and Saskatchewan to Brit. Col. and Oregon; S. to Colo. and Tex. Mexico.

Minn. valley: W. district; high knolls and dry plains or banks.

HERB.: *Sheldon* 1370, Lake Benton.

Penstemon grandiflorus NUTT. Fras. Cat. (1813).

P. bradburii PURSH, *Fl. Am.* 738 (1814).

Chelone grandiflora SPRENG. Syst. II, 813 (1825).

Wats. and Coult., Gray's Man. 6 ed. 382; Webb., *Fl. Neb.* 137; Upham, *Fl. Minn.* 99; Wats., King Exp. 452; Gray, Syn. *Fl.* II, 1, 264; Coult., *Fl. Tex.* 308.

North America: Ill., Wisc., Minn., Dak., Neb., Kan., Tex.

Minn. valley: Throughout; frequent; particularly abundant in Renville Co.; banks and dry hills.

HERB.: *Ballard* 243, Jordan, Scott Co.; *Sheldon* 827, Cottonwood river, near Sleepy Eye; *Oestlund* 115, Hennepin Co.; *Herrick* 199, Minneapolis; *Richardson* 1, Goodhue Co.; *Kassube* 161, Minneapolis; *Sandberg* 399, Cannon Falls; *Herb. Sheld.* 1889, Ft. Snelling; *Herb. Wickersheim* 90, Idlewild, Lincoln Co.; *Herb. Moyer* 164, Montevideo.

Penstemon teretiflorus NUTT. Fras. Cat. (1813).

P. albidus NUTT. Gen. II, 53 (1818).

P. viscidulum NEES, Neuwied App. 18 (—).

P. cristatus MAC. *Fl. Can.* I, 355 (1884).

Chelone alba SPRENG. Syst. II, 813 (1825).

Wats. and Coult., Gray's Man. 6 ed. 382; Webb., *Fl. Neb.* 137; Mac., *Fl. Can.* I, 570; Coult., *Fl. Colo.* 276; Roth., Wheel. Exp. 211; Wats., King Exp. 454; Gray, Syn. *Fl.* II, 1, 266; Coult., *Fl. Tex.* 308.

North America: Red River prairie, 49° N. lat. to Minn. valley, near Appleton; S. and W. to Dak., Col., Neb. and Tex.

Minn. valley: S. W. district and probably N. W.; dry banks and knolls.

HERB.: *Menzel* 3, Pipestone; *Herb. Moyer* 264, Montevideo.

Penstemon gracilis NUTT. Gen. II, 52 (1818).

P. pubescens var. *gracilis* GRAY, Proc. Am. Acad. VI, 57 (1862).

Chelone gracilis SPRENG. Syst. II, 813 (1825).

Wats. and Coult., Gray's Man. 6 ed. 382; Gray, Syn. Fl. II, 1, 267; Webb., Fl. Neb. 137; Coult., Fl. Colo. 277; Mac., Fl. Can. I, 356; Upham, Suppl. Minn. 86.

North America: Minn., Man. and Saskatchewan to Wyoming and Colo.

Minn. valley: Throughout; infrequent; open places, banks and knolls.

HERB.: *Menzel* 8, Pipestone; *Ballard* 244, Jordan, Scott Co.; *Ballard* 382, Jordan; *Taylor* 789, Glenwood; *Sandberg* 609, Cannon Falls; *Herrick* 341, Minneapolis; *Holzinger* 297, Winona Co.; *Kassube* 278, Minneapolis; *Herrick* 345, Minneapolis.

Penstemon hirsutus (LINN.) WILLD. Spec. III, 227 (1800).

Chelone hirsutus LINN. Spec. 849 (1753).

C. pentstemon LINN. Mant. 415 (1767).

Penstemon pubescens SOLAND. Ait. Hort. Kew. II, 360 (1789).

Wats. and Coult., Gray's Man. 6 ed. 381; Mac., Fl. Can. I, 356; Upham, Fl. Minn. 99; Chap., Fl. S. St. 290; Britt., Fl. N. J. 184; Wats., King Exp. 454; Cov., Fl. Ark. 207; Gray, Syn. Fl. II, 1, 268; Engl. Wettst., Nat. Pflanz. IV, 3, 65; Coult., Fl. Colo. 303.

North America: Ont. to S. Man., Minn. and Iowa; S. to Maine, N. J., Fla. and Tex.

Minn. valley: W. district; high dry prairies; also N. E. and S. E.; open places.

HERB.: *Sheldon* 1566, Lake Benton; *Kassube* 161, Minneapolis; *Herrick* 198, Minneapolis; *Herb. Wickersheim* 91, Idlewild; *Gedge* 20, Moorhead; *Wickersheim* 136, Lake Benton; 137, Lake Benton (the last two Nos. are apparently intermediate forms between *P. teretiflorus* Nutt. and *P. hirsutus* (Linn.), having the foliage of the former and the flowers and pubescence of the latter.—*Sheldon*.

MIMULUS LINN. Act. Ups. 82 (1741).

Eumanus BENTH. DC. Prodr. X, 374 (1846).

Diplacus NUTT. Ann. Nat. Hist. 1, I, 37 (—).

Uvedalia R. BR. Prodr. 440 (1810).

Erythranthe SPACH, Suit. Buff. IX, 312 (1840).

Baillon, *Hist. Pl.* IX, 450; Benth. and Hook., *Gen. Pl.* II, 946, 1245; Durand, *Ind. Gen. Phan.* 294; Engler and Prantl, *Nat. Pflanz.* IV, 3 b, 71 (von Wettstein).

Living species: 60; W. extratropical America and a few in S. and E. Asia, Australia and E. Africa. Russia, 2; Europe, 1, introduced; Canada, 8; E. Sts., 3; S. Sts., 2; Pl. Wheel., 12; Pl. King, 12; Rocky mts., 7-8; California, 30; W. Tex., 4.

Mimulus glabratus HBK. var. **jamesii** (T. and G.) GRAY, Syn. Suppl. II, 447 (1886).

M. jamesii T. and G. Man. 2 ed. 287 (1852).

M. glabratus GRAY, Bot. Mex. Bound 116 (1856).

Wats. and Coult., Gray's Man. 6 ed. 383; Mac., Fl. Can. I, 357; Coult., Fl. Colo. 280; Upham, Fl. Minn. 99; Mac., Fl. Can. I, 570; Wats., King. Exp. 224; Gray, Syn. Fl. II, 1, 276; Coult., Fl. Tex. 309.

North America: Ont. to Mich., Ill., Minn., Neb. and Mont.; S. to Tex., Arizona, N. Mex. and Mexico.

Minn. valley: Throughout; N. districts and to Blue Earth Co.; cool rills and springs; aquatic.

HERB.: *Taylor* 757, Glenwood; *Oestlund* 117, Minneapolis; *Herrick* 201, Minneapolis; *Herrick* 202, Minneapolis; *Kassube* 164, Minneapolis; *Sandberg* 401, Cannon Falls.

Mimulus ringens LINN. Spec. 634 (1753).

Wats. and Coult., Gray's Man. 6 ed. 383; Britt., Fl. N. J. 185; Upham, Fl. Minn. 99; Webb., Fl. Neb. 137; Chap., Fl. S. St. 291; Mac., Fl. Can. I, 357; Led. Fl. Ross. III, 223; Miyabe, Fl. Kur. 253; Gray, Syn. Fl. II, 1, 276 and Suppl. Syn. II, 446; Coult., Fl. Tex. 309.

Kurile Islands.

North America: Cape Breton to Hudson Bay and Saskatchewan; S. to N. Eng., N. J. and N. Car.; W. to Minn., Neb. and Tex.

Minn. valley: Throughout; banks of streams and shores of lakes.

HERB.: *Sheldon* 948, Redwood Falls; *Taylor* 1081, Glenwood; *Taylor* 739, Glenwood; *Ballard* 715, Benton, Carver Co.; *Sheldon* 689, Waseca; *Ballard* 811, Page lake, Carver Co.; *Ballard* 670, Waconia; *Ballard* 612, Chaska; *Ballard* 497, Prior's lake, Scott Co.; *Oestlund* 116, Minneapolis; *Roberts* 96, Stewart river; *Holzinger* 145, Winona Co.; *Kassube* 163, Minneapolis; *Herrick* 200, Minneapolis; *Bailey* 116, Vermilion lake; *Sandberg* 400, Cannon Falls; *Herb. Sheld.* 1676, Minneapolis; *Herb. Moyer* 165, 166, Montevideo; *Sheldon* 1086½, Springfield.

GRATIOLA LINN. Gen. 833 (1737).**Sophranthe** BENTH. Lindl. *Introd.* ed. 2, 445 (1835).**Nibora** RAF. Fl. Lud. 36 (1817).**Fonkia** PHIL. Linn. XXX, 198 (1856).

Baillon, *Hist. Pl.* IX, 448; Benth. and Hook., *Gen. Pl.* II, 953; Durand, *Ind. Gen. Phan.* 295; Engler and Prantl, *Nat. Pflanz.* IV, 3 b, 75 (*von Wettstein*).

Living species: 25; cosmopolitan, but especially in extra-tropical regions. Russia, 1; Russian Europe, 1; N. America, 13; S. Sts., 10; Rocky mts., 1; California, 2; Canada, 3; E. Sts. 5; Pl. King, 1; Pl. Wheel., 1; W. Tex., 6.

Gratiola virginiana LINN. Spec. 17 (1753).*G. officinalis* MICHX. Fl. N. Am. I, 6 (1803).*G. carolinensis* PERS. Syn. I, 14 (1805).*G. neglecta* TORR. Cat. N. Y. Pl. (1819).*G. missouriana* BECK, Am. Journ. Sci. ser. i, X, 258 (1826).*Conobea borealis* SPRENG. Syst. II, 771 (1825).

Wats. and Coult., *Gray's Man.* 6 ed. 384; Britt., Fl. N. J. 185; Coult., Fl. Colo. 281; Upham, Fl. Minn. 99; Chap., Fl. S. St. 292; Mac., Fl. Can. I, 358; Brew. and Wats., Fl. Calif. I, 570; Wats., *King Exp.* 227; Roth, Wheel. *Exp.* 214; Cov., Fl. Ark. 208; Gray, Syn. Fl. II, 1, 281; Engl. *Wettst.*, *Nat. Pflanz.* IV, 3, 75; Coult., Fl. Tex. 311.

North America: Q., Ont. to Man., Brit. Col. and N. W. T.; S. to Oregon and Calif.; S. to Minn., Dak. and Neb. to Ark.; E. to N. Eng., N. J. and Fla.

Minn. valley: Forest district to Nicollet Co.; wet places, marshes and peat bogs.

HERB.: *Herrick* 204, St. Louis river; *Holzinger* 146, Winona Co.; *Holzinger* 147 and 148, Winona Co.

ILYSANTHES RAF. Ann. Nat. 13 (1820).**Bonnaya** LINK and OTT. Pl. Sel. 25 (1840).

Baillon, *Hist. Pl.* IX, 458 (*sub Torenia* Linn.); Benth. and Hook., *Gen. Pl.* II, 955; Durand, *Ind. Gen. Phan.* 295; O. Kuntze, *Rev. Gen.* II, 461; Engler and Prantl, *Nat. Pflanz.* IV, 3 b, 80 (*von Wettstein*).

Living species: 17; tropical regions, and N. America and Australia; S. Africa. N. America, 3; S. Sts. 3; Canada, 1; California, 1; E. Sts., 1; W. Tex., 1.

Ilysanthes gratioloides (LINN.) BENTH. DC. Prodr. X, 418 (1846).*Capraria gratioloides* LINN. Spec. 2 ed. 876 (1762).*Gratiola anagallidea* MICHX. Fl. N. Am. I, 5 (1803).*G. dilatata* MUHL. Cat. (1813).*Lindernia pyxidaria* PURSH, Fl. Am. 419 (1814).*Herpestis callitrichoides* HBK. N. Gen. et Spec. (1818).*Ilysanthes riparia* RAF. Ann. Nat. 13 (1820).? *Gratiola tetragona* ELL. Sk. I, 15 (1821).*G. attenuata* SPRENG. Syst. I, 39 (1825).

Wats. and Coult., Gray's Man. 6 ed. 385; Britt., Fl. N. J. 186; Mac., Fl. Can. I, 359; II, 348; Upham, Fl. Minn. 100; Chap., Fl. S. St. 294; Brew. and Wats., Fl. Calif. I, 571; Webb., Fl. Neb. 137; Cov., Fl. Ark. 208; Gray, Syn. Fl. II, 1, 283; Engl. Wettst., Nat. Pflanz. IV, 3 b, 80; Coult., Fl. Tex. 311.

Naturalized in Europe; E. Asia; S. America.

North America: N. Br., Q., Ont. to Minn. and Oregon; S. in Sierra Nevada; U. S., east of the Mississippi, throughout.

Minn. valley: Forest district to Blue Earth Co.; wet places and peat bogs.

HERB.: *Ballard* 319, Belle Plaine; *Herrick* 205, Minneapolis; *Holzinger* 149, Winona Co.; *Sandberg* 402, Red Wing; *Holzinger* 150, Winona.

VERONICA LINN. Gen. 10 (1737).

Hebe JUSS. Gen. 105 (1786).

Pygmaea HOOK. f. N. Zeal. Fl. 217 (1867).

Cymbophyllum F. MULL. Hook. Kew. Journ. VIII, 202 (1857).

Leptandra NUTT. Gen. I, 1 (1818).

Diplophyllum LEHM. Ges. Nat. Berl. Mag. VIII, 310 (1803).

Baillon, *Hist. Pl.* IX, 465; Penth. and Hook., *Gen. Pl.* II, 964; Durand, *Ind. Gen. Phan.* 297; Engler and Prantl, *Nat. Pflanz.* IV, 3 b, 85 (*von Wettstein*); Schenck, *Palaeophyt* 778.

Living species: 200±; temperate and colder regions; richly developed in mt. districts. Mts. of New Zealand, 59; Europe, 75; Russia, 55; N. America, 11; E. Sts., 8; S. Sts., 6; Canada, 11; Rocky mts., 6; California, 5-6; Pl. Wheel., 4-5; Pl. King, 5; W. Tex., 1.

Fossil species: *Veronicites* in Miocene of Oeningen (*Heer*).

Veronica peregrina LINN. Spec. 20 (1753).

V. marilandica MURR. Comm. Gött. II, 3 (1782).

V. caroliniana WALT. Fl. Car. 61 (1788).

V. xalapensis HBK. N. Gen. et Spec. (1818).

Wats. and Coult., Gray's Man. 6 ed. 387; Britt., Fl. N. J. 187; Webb., Fl. Neb. 137; Chap., Fl. S. St. 295; Coult., Fl. Colo. 283; Upham, Fl. Minn. 100; Mac., Fl. Can. I, 362; Brew. and Wats., Fl. Calif. I, 572; Forbes and Hems., Fl. Sin. II, 199; Nym., Fl. Eur.; Led., Fl. Ross. III, 249; Roth., Wheel. Exp. 215; Wats., King Exp. 228; Cov., Fl. Ark. 208; Gray, Syn. Fl. II, 1, 288; Engl. v. Wetts., Nat. Pflanz. IV, 3 b, 85; Coult., Fl. Tex. 312.

Europe; Asia, Japan, China; S. America—Chile to Patagonia.

North America: Throughout continent, from Arctic sea to Mexico and C. America.

Minn. valley: Throughout, except far W.; waste ground.

HERB.: *Ballard* 517, Long lake, Scott Co.; *Taylor* 430, Janesville; *Kassube* 168, Minneapolis; *Oestlund* 120, Ramsey Co.; *Holzinger* 154, Winona; *Herrick* 208, Minneapolis; *Sandberg* 408, Goodhue Co.

***Veronica scutellata* LINN. Spec. 16 (1753).**

Wats. and Coult., Gray's Man. 6 ed. 387; Britt., Fl. N. J. 187; Mac., Fl. Can. I, 361; Upham, Fl. Minn. 100; Coult., Fl. Colo. 282; Brew. and Wats., Fl. Calif. I, 572; Nym., Fl. Eur.; Led., Fl. Ross. III, 244; Hook., Fl. Gt. Brit. 302; Herd., Fl. Eur. Russ. 96; Gray, Syn. Fl. II, 1, 287; Hart., Fl. Scand. I, 111; Engl. v. Wetts., Nat. Pflanz. IV, 3 b, 86.

Europe: Arctic to S. Russia and westward; Siberia and N. Africa.

North America: Atl. to Pac. in Can. and N. to 56° N. lat.; S. to Oregon, N. Calif., Minn., Mont., N. Eng., and N. J.

Minn. valley: Forest district; rare; bogs and marshes.

HERB.: *Holzinger* 152, Winona Co.; *Bailey* 99, Vermilion lake; *Holzinger* 153, Winona.

***Veronica americana* SCHWEIN. Herb. Hook., DC. Prodr. X, 460 (1846).**

V. beccabunga Auct. Amer. Vet.

V. intermedia SCHWEIN. Am. Jour. Sci. ser. I, VIII, 268 (1824).

V. anagallis BONG. Veg. Sitka (1841).

Wats. and Coult., Gray's Man. 6 ed. 386; Britt., Fl. N. J. 187; Mac., Fl. Can. I, 360; Webb., Fl. Neb. 137; Upham, Fl. Minn. 100; Brew. and Wats., Fl. Calif. I, 572; Coult., Fl. Colo. 282; Gray, Syn. Fl. II, 1, 287; Roth., Wheel. Exp. 215; Wats., King Exp. 227; Cov., Fl. Ark. 208; Engl. v. Wetts., Nat. Pflanz. IV, 3 b, 86.

North America: Anticosti, N. S., N. Br. to Pac.; N. to Athabasca and Sitka; S. to N. Eng., N. J.; W. to Mont., Dak., Colo., N. Mex.; S. in Calif.

Minn. valley: Throughout; frequent; springs, rills and ditches.

HERB.: *MacMillan* 14, Glenwood; *Taylor* 754, Glenwood; *Ballard* 107, Carver; *Ballard* 627, Chaska; *Sheldon* 721, Sleepy Eye; *Roberts* 98, Beaver bay; *Holzinger* 151, Winona Co.; *Sandberg* 406, Cannon Falls; *Kassube* 167, Minneapolis; *Herrick* 207, Minneapolis; *Oestlund* 119, Minneapolis; *Sandberg* 407, Chisago Co.; *Herb. Sheld.* 1760, Ramsey Co.

***Veronica anagallis* LINN. Spec. 16 (1753).**

Wats. and Coult., Gray's Man. 6 ed. 386; Britt., Fl. N. J. 187; Webb., Fl. Neb. 136; Mac., Fl. Can. I, 360; Upham, Fl. Minn. 100; Coult., Fl. Colo. 282; Brew. and Wats., Fl. Calif. I, 572; Gray, Syn. Fl. II, 1, 287; Forbes and Hems., Fl. Sin. II, 198; Nym., Fl. Eur.; Led., Fl. Ross. III, 236; Hook., Fl. Gt. Brit. 302; Herd., Fl. Eur. Russ. 96; Wats., King Exp. 227; Engl. Wettst., Nat. Pflanz. IV, 3 b, 86; Hart., Fl. Scand. I, 111.

Europe, except arctic reg.; Russ. to Caucasus, Sib., Dahuria, Kamtk. and China; N. Africa; intro.? in S. America.

North America: N. S., Q., Ont., Owen Sound. L. Superior reg., N. W. T., Rockies and coast of Brit. Col.; S. to Oregon; S. to N. Eng., N. J.; W. to Minn., Neb., Colo., N. Mex.

Minn. valley: Forest district; springs, rills and ditches; aquatic or semi-aquatic.

HERB.: *Ballard* 998, Long lake, Scott Co.; *Kassube* 166, Minneapolis; *Sandberg* 405, Cannon Falls.

***Veronica virginica* LINN. Spec. 9 (1753).**

V. sibirica LINN. Spec. 2 ed. 12 (1762).

Leptandra virginica NUTT. Gen. I, 7 (1818).

L. purpurea RAF. Med. Bot. 59 (1830).

Wats. and Coult., Gray's Man. 6 ed. 386; Britt., Fl. N. J. 186; Mac., Fl. Can. I, 360; Webb., Fl. Neb. 137; Upham, Fl. Minn. 100; Chap., Fl. S. St. 295; Forbes and Hems., Fl. Sin. II, 200; Cov., Fl. Ark. 208; Gray, Syn. Fl. II, 1, 286; Engl. Wettst., Nat. Pflanz. IV, 3 b, 85.

Japan, China and E. Siberia.

North America: Ont. to Man., Minn. and Neb.; S. to Vt., N. J. and Alab.; W. to Kan. and Ark.

Minn. valley: Throughout; common; rich woods and river banks.

HERB.: *Sheldon* 764, Sleepy Eye; *Sheldon* 665, Waseca; *Sheldon* 1096, Springfield; *Sheldon* 1348, Lake Benton; *Ballard* 510, Prior's lake, Scott Co.; *Taylor* 985, Glenwood; *Ballard* 312, Belle Plaine; *Ballard* 691, Waconia; *Taylor* 985a, Glenwood; *Herrick* 206, Minneapolis; *Kassube* 165, Minneapolis; *Oestlund* 118, Minneapolis; *Leonard* 32, Minneapolis; *Sandberg* 404, Goodhue Co.; *Herb. Sheld.* 1645, Minneapolis.

SYNTHYRIS BENTH. DC. Prodr. X, 454 (1846).

Baillon, *Hist. Pl.* IX, 466; Benth. and Hook., *Gen. Pl.* II, 963; Durand, *Ind. Gen. Phan.* 296; Engler and Prantl, *Nat. Pflanz.* IV, 3 b, 87 (von Wettstein).

Living species: 7; mts. of W. N. America; 1, in E. Sts. Rocky mts., 4; California, 2; Illinois and Minn., 1.

***Synthyris houghtoniana* BENTH. DC. Prodr. X, 454 (1846).**

Wats. and Coult., Gray's Man. 6 ed. 386; Upham, Fl. Minn. 100; Gray, Syn. Fl. II, 1, 286.

North America: Minn. to Mich.; S. to Ill., Mo. and Ind.

Minn. valley: N. E. districts; beside springs or edges of bogs; infrequent. Not found on "hills or ridges" very often.

HERB.: *Holtz* 4, Cedar lake, Hennepin Co.; *Sandberg* 403, Red Wing.

GERARDIA LINN. Gen. 503 (1737).*Virgularia* R. and P. Prodr. Per. 92 (1794).*Dasystema* RAF. Jour. Phys. LXXXIX, 99 (1819).*Otophylla* BENTH. DC. Prodr. X, 515 (1846).

Bailion, *Hist. Pl.* IX, 468; Benth. and Hook., *Gen. Pl.* II, 972; Durand, *Ind. Gen. Phan.* 298; Engler and Prantl, *Nat. Pflanz.* IV, 3 b, 92 (von Wettstein).

Living species: 30; N. and S. America, especially in extra-tropical regions. N. America, 23; S. Sts., 10; E. Sts., 13; Canada, 6; Pl. Wheel., 1; Rocky mts., 2; W. Tex., 8.

Gerardia pedicularia LINN. Spec. 611 (1753).*Dasystema pedicularia* BENTH. DC. Prodr. X, 521 (1846).

Wats. and Coult., Gray's Man. 6 ed. 389; Britt., Fl. N. J. 189; Mac., Fl. Can. I, 363; Upham, Fl. Minn. 101; Cov., Fl. Ark. 209; Gray, Syn. Fl. II, 1, 291; Chap., Fl. S. St. 298; Engl. v. Wetts., Nat. Pflanz. IV, 3 b, 93.

North America: Ont. to N. Eng., N. J. and Fla.; W. to Minn. and Ark.

Minn. valley: N. E. district; infrequent; thickets and dry woods.

HERB.: *Herrick 211*, Minneapolis.

Gerardia grandiflora BENTH. Comp. Bot. Mag. I, 206 (1835).*Dasystema drummondii* BENTH. DC. Prodr. X, 521 (1846).

Wats. and Coult., Gray's Man. 6 ed. 389; Upham, Fl. Minn. 101; Cov., Fl. Ark. 208; Gray, Syn. Fl. II, 1, 291; Engl. v. Wetts., Nat. Pflanz. IV, 3 b, 93; Coult., Fl. Tex. 314.

North America: Wisc., S. Minn., Iowa to Tenn. and Tex.; W. to Ark.

Minn. valley: Forest district; rare or doubtful; no Minn. specimens seen.

Gerardia virginica (LINN.) B. S. P. Cat. N. Y. (1888).*Rhinanthus virginicus* LINN. Spec. 841 (1753).*Gerardia flava* LINN. Herb.*G. quercifolia* PURSH, Fl. Am. 423 (1814).*G. glauca* SPRENG. Syst. II, 807 (1825).*Dasystema quercifolia* BENTH. DC. Prodr. X, 521 (1846).

Wats. and Coult., Gray's Man. 6 ed. 389; Britt., Fl. N. J. 189; Upham, Fl. Minn. 101; Cov., Fl. Ark. 209?; Gray, Syn. Fl. II, 1, 291; Chap., Fl. S. St. 298.

North America: Ont. and N. Eng. to N. J. and Fla.; W. to Minn., Ill., Ark.? and La.

Minn. valley: Reported from S. E. edge; doubtful or rare; no Minn. specimens seen.

Gerardia auriculata MICHX. Fl. N. Am. II, 20 (1803).*Seymeria auriculata* SPRENG. Syst. II, 810 (1825).*Otophylla michauxii* BENTH. DC. Prodr. X, 512 (1846).

Wats. and Coult., Gray's Man. 6 ed. 389; Britt., Fl. N. J. 189; Upham, Fl. Minn. 101; Cov., Fl. Ark. 208; Gray, Syn. Fl. II, 1, 292; Engler v. Wetts., Nat. Pflanz. IV, 3 b, 93.

North America: Penn. to N. J. and N. Car.; W. to Minn., Mo. and Ark.

Minn. valley: S. central district; infrequent; low or moist ground near bases of hills.

Gerardia aspera DOUGL. Benth. DC. Prodr. X, 520 (1846).

G. longifolia BENTH. Comp. Bot. Mag. I, 208 (1835).

Wats. and Coult., Gray's Man. 6 ed. 390; Webb., Fl. Neb. 136; Mac., Fl. Can. I, 363; Coult., Fl. Colo. 283; Upham, Fl. Minn. 101; Cov., Fl. Ark. 208; Gray, Syn. Fl. II, 1, 292; Engl. v. Wetts., Nat. Pflanz. IV, 3 b, 92; Coult., Fl. Tex. 314.

North America: Saskatchewan and Red valleys to Minn., Dak., Neb., Ark. and Tex.; E. to Mich. and Ind.

Minn. valley: N. W. and W.; damp or dry places on prairie.

HERB.: *Taylor* 1074½, Winona lake, Douglas Co.; *Sheldon* 1363, Lake Benton; *Sandberg* 410, Red Wing.

Gerardia purpurea LINN. Spec. 610 (1753) *in part*.

G. maritima var. *major* CHAP. Fl. S. St. 300 (1860).

Wats. and Coult., Gray's Man. 6 ed. 390; Britt., Fl. N. J. 138; Mac., Fl. Can. I, 363; Upham, Fl. Minn. 100; Webb., Fl. Neb. 136; Gray, Syn. Fl. II, 1, 293; Engl. v. Wetts., Nat. Pflanz. IV, 3 b, 92; Coult. Fl. Tex. 314.

North America: S. Ont. and N. Eng. to Penn., N. J. and Fla., also in Cuba; W. to Minn., Neb., Miss. and Tex.

Minn. valley: Throughout on higher levels; level ground or hillsides.

HERB.: *Taylor* 1038, Glenwood; *Kassube* 169, Minneapolis; *Herrick* 209, Minneapolis; *Sandberg* 409, Red Wing; the following are var. *paupercula* Gray; *Ballard* 844, Patterson lake, Carver Co.; *Ballard* 807, Goose lake, Carver Co.; *Herb. Sheld.* 1659, Minneapolis.

Gerardia tenuifolia VAHL, Symb. III, 79 (1807).

G. purpurea LINN. Spec. 610 (1753) *in part*.

? *G. erecta* WALT. Fl. Car. 170 (1788).

Wats. and Coult., Gray's Man. 6 ed. 390; Britt., Fl. N. J. 188; Webb., Fl. Neb. 136; Mac., Fl. Can. I, 364, 571; Coult., Fl. Colo. 283; Chap., Fl. S. St. 300; Upham, Fl. Minn. 101; Cov., Fl. Ark. 209; Gray, Syn. Fl. II, 1, 294 and Suppl. Syn. II, 452.

North America: Q., Ont. to Man. and Minn.; S. to N. J. and Fla.; W. to Mich., Neb., Ark. and La.

Minn. valley: Throughout; frequent; woods and hillsides.

HERB.: *Taylor* 1066, Winona lake, Douglas Co.; *Sheldon* 1468, Pipestone City; *Sheldon* 1564, Lake Benton; *Oestlund* 121, Hennepin Co.; *Holzinger* 155 Winona Co.; *Herrick* 210, Minneapolis; *Winchell* 24, Richfield; *Sandberg* 411, Goodhue Co.; *Sandberg* 412, Red Wing; *Herb. Sheld.* 1667, Minneapolis; *Herb. Moyer* 167, Chippewa river near Montevideo.

***Gerardia tenuifolia* VAHL, var. *asperula* GRAY, Bot. Gaz. IV, 153 (1877).**

Wats. and Coult., Gray's Man. 6 ed. 390; Gray, Syn. Suppl. II, 452.

North America: Mich. and Ind. to Minn. and Mo.

Minn. valley: Reported from E. edge and S. E. district; dry woods and hills.

CASTILLEJA LINN. f. Suppl. 47 (1781).

***Euchroma* NUTT. Gen. II, 54 (1818).**

Baillon, *Hist. Pl.* IX, 482; Benth. and Hook., *Gen. Pl.* II, 973; Durand, *Ind. Gen. Phan.* 298.

Living species: 35-40; N. and S. America and N. Asia. N. America, 25; California, 12-15; S. Sts., 1; Rocky mts., 10; Canada, 6-7; E. Sts., 3; Pl. Wheel. 7; Pl. King, 5; several sp. in Mexico; only 2 in S. America; 1, Brazil; 1, Andes region; centers in W. N. America; W. Tex., 7.

***Castilleja sessiliflora* PURSH, Fl. Am. 738 (1814).**

Euchroma grandiflora NUTT. Gen. II, 55 (1818).

Castilleja grandiflora SPRENG. Syst. II, 775 (1825).

Wats. and Coult., Gray's Man. 6 ed. 391; Mac., Fl. Can. I, 366; Upham, Fl. Minn. 101; Coult., Fl. Colo. 285; Wats., King. Exp. 457; Gray, Syn. Fl. II, 1, 298 and Suppl. Syn. II, 452; Coult., Fl. Tex. 316.

North America: Assiniboia to Wisc., Minn., Ill., Dak., Tex., N. Mex. and Mexico; W. to Mont. and Calif. (S. region).

Minn. valley: Prairie district, especially W.; high sterile knolls and edges.

HERB.: *Sheldon* 1391, Lake Benton; *Taylor* 831, Glenwood; *Sandberg* 415, Goodhue Co.; *Leiberg* 46, "Minnesota;" *Herb. Wickersheim* 92, Idlewild, Lincoln Co.; *Herb. Moyer* 168, Montevideo.

***Castilleja pallida* (LINN.) KUNTH, var. *acuminata* (PURSH).**

Bartsia acuminata PURSH, Fl. Am. 429 (1814).

Castilleja acuminata SPRENG. Syst. II, 774 (1825).

C. septentrionalis LINDL. Bot. Reg. 925 (1836-46).

C. pallida var. *septentrionalis* GRAY, Bot. Calif. I, 573 (1876).

Wats. and Coult., Gray's Man. 6 ed. 391; Mac., Fl. Can. I, 365, 572; Upham, Fl. Minn. 101; Coult., Fl. Colo. 284; Gray, Syn. Fl. II, 1, 297; Nym., Fl. Eur. (spec.); Trautv., Fl. Sib. (spec.) 89; Led., Fl. Ross. (spec.) III, 257;

Herd., Fl. Eur. Russ. (spec.) 96; Roth., Wheel. Exp. 7, 216; Wats., King Exp. 229, 456.

The species ranges through Siberia and N. Europe.

North America: N. Br., Q., Ont. to Arctic sea, Rockies and Oregon; S. to N. Eng. mts.; S. to Dak., Minn., Mont.; S. in Rockies to Colo. and Utah.

Minn. valley: Reported from Leaf hills district; rare or doubtful; high, sterile knolls.

Castilleja coccinea (LINN.) SPRENG. Syst. II, 775 (1825).

Bartsia coccinea LINN. Spec. 602 (1753).

Euchroma coccinea NUTT. Gen. II, 55 (1818).

Wats. and Coult., Gray's Man. 6 ed. 390; Britt., Fl. N. J. 189; Mac., Fl. Can. I, 364; Upham, Fl. Minn. 101; Wats., King Exp. 456; Cov., Fl. Ark. 209; Gray, Syn. Fl. II, 1, 295; Coult., Fl. Tex. 315.

North America: Ont., Gt. lakes to Man. and Minn.; S. to Maine, N. J., Tenn. and W. to Ark. and Tex.

Minn. valley: Forest district; rare W. of this region; openings in woodland.

HERB.: *Taylor* 345, Janesville; *Ballard* 257, Jordan, Scott Co.; *Sheldon* 514, Waseca; *Ballard* 462, Prior's lake, Scott Co.; *Sandberg* 413, Red Wing; *Sandberg* 414, Cannon Falls; *Oestlund* 122, Ramsey Co.; *Kassube* 170, Minneapolis; *Holzinger* 156, Winona Co.; *Herrick* 212, St. Louis river; *Bailey* 302, St. Louis river; *Herrick* 213, Minneapolis; *Hammond* 26, Lake City; *Herb. Sheld.* 1722, Minneapolis; *Herb. Sheld.* 1761, Ramsey Co.

PEDICULARIS LINN. Gen. 513 (1737):

Baillon, *Hist. Pl.* IX, 477; Benth. and Hook., *Gen. Pl.* II, 978; Durand, *Ind. Gen. Phan.* 299.

Living species: 135 ±; Europe; temperate and N. Asia; N. America; East Indies. Russia, 60; Europe, 45; Russian Europe, 18; N. America, 30; Canada, 19; E. Sts., 3; California, 6; Pl. Wheel., 6; Pl. King, 3; Rocky mts., 8; S. Sts., 2.

Pedicularis lanceolata MICHX. Fl. N. Am. II, 18 (1803).

P. virginica POIR. Enc. Meth. V, 126 (1804).

P. pallida and *resupinata* PURSH, Fl. Am. 424 (1814).

P. auriculata SM. ex Benth. DC. Prodr. x, 577 (1846).

Wats. and Coult., Gray's Man. 6 ed. 393; Britt., Fl. N. J. 190; Upham, Fl. Minn. 102; Mac., Fl. Can. I, 369, 572; Chap., Fl. S. St. 301; Gray, Syn. Fl. II, 1, 307.

North America: Ont. to Man., Minn., Neb.; S. to Conn., N. J., Va. and N. Car?; W. to Iowa and Mo.

Minn. valley: Throughout, especially W. and S. W. districts; marshes and swamps.

HERB.: *Taylor* 958, Glenwood; *Sheldon* 1036, Sleepy Eye; *Taylor* 1022, Glenwood; *Sheldon* 1523, Lake Benton; *Sheldon* 1314, Verdi, Lincoln Co.; *Kassube* 172, Minneapolis; *Holtinger* 157, Winona Co.; *Leiberg* 47, Blue Earth Co.; *Oestlund* 124, Minneapolis; *Sandberg* 417, Red Wing; *Herb. Sheld.* 1669, Minneapolis.

Pedicularis canadensis LINN. Mant. 86 (1767).

P. gladiata MICHX. Fl. N. Am. II, 18 (1803).

P. aequinoctialis HBK. N. Gen. et Spec. II, 332 (1817).

Wats. and Coult., Gray's Man. 6 ed. 392; Britt., Fl. N. J. 189; Mac., Fl. Can. I, 369, 572; Cov., Fl. Ark. 209; Upham, Fl. Minn. 102; Coult., Fl. Colo. 287; Chap., Fl. S. St. 301; Gray, Syn. Fl. II, 1, 307; Webb., Appx. Neb. 38.

North America: N. S., N. Br., Q., Ont. to Man. and Saskatchewan; S. to N. Eng., N. J. and Fla.; W. to Minn., Dak., Neb., Colo. in mts.; S. to Ark. and Mexico.

Minn. valley: Throughout; frequent; banks of streams and edges of copses or woods.

HERB.: *Sheldon* 1313, Lake Benton; *Sheldon* 523, Waseca; *Sheldon* 650, Wilton, Waseca Co.; *Taylor* 113, Janesville; *Taylor* 113a, Janesville; *Taylor* 769, Glenwood; *Oestlund* 123, Minneapolis; *Herrick* 214, Minneapolis; *Kassube* 171, Minneapolis; *Sandberg* 416, Cannon Falls; *Herb. Sheld.* 1712, Ramsey Co.; *Herb. Sheld.* 1906, Minneapolis; *Herb. Wickersheim* 93, Mankato; *Herb. Moyer* 169, Black Oak, Chippewa Co.

MELAMPYRUM LINN. Gen. 507 (1737).

Baillon, *Hist. Pl.* IX, 483; Benth. and Hook., *Gen. Plant.* II, 679; Durand, *Ind. Gen. Phan.* 299.

Living species: 10; Europe; most Asia; 1 sp. N. America. Russia, 6; Japan, 2; Europe, 6.

Melampyrum lineare LAM. Enc. Meth. IV, 23 (1797).

M. americanum MICHX. Fl. N. Am. II, 16 (1803).

M. latifolium MUHL. Cat. (1813).

M. brachiatum SCHWEIN. Keat. Narr. 115 (1825).

M. sylvaticum HOOK. Fl. Bor.-Am. II, 106 (1840).

M. pratense var. *americanum* BENTH. DC. Prodr. X, 584 (1846).

Wats. and Coult., Gray's Man. 6 ed. 393; Britt., Fl. N. J. 190; Mac., Fl. Can. I, 372; Upham, Fl. Minn. 102; Chap., Fl. S. St. 302; Gray, Syn. Fl. II, 1, 310; Cov., Fl. Ark. 209.

North America: Anticosti, N. S., N. Br., Q., Ont. to Coast range, Brit. Col.; S. to Minn., Iowa and Ark.; E. to Atl. and mts. of Ga.

Minn. valley: Forest district; rare or local; rich woods along streams or near lakes.

HERB.: *Bailey* 193, Vermilion lake; *Roberts* 99, Duluth; *Roberts* 100, Minnesota Point.

MONNIERA P. BR. Hist. Jam. (1756).

Bramia LAM. Enc. Meth. I, 459 (1783).

Mella VAND. Lusit. Fl. 43 (1788).

Septas LOUR. Cochinch. 392 (1790).

Heptas MEISSN. Gen. Pl. 293 (1836).

Mecardonia and **Calytriplex** R. and P. Prodr. Per. 95, 96 (1794).

Caconapea and **Ranaria** CHAM. Linn. VIII, 28, 30 (1834).

Cardiophorus GRIFF. Notul. IV, 105 (1851).

Anisocalyx HANCE, Walp. Ann. III, 195 (1854).

Herpestis GAERTN. Fruct. III, 186 (1805).

Ranapalus KELL. Cal. Acad. Sci. VII, 113 (1886).

Baillon, *Hist. Pl.* IX, 449; Benth. and Hook., *Gen. Pl.* II, 951; Durand, *Ind. Gen. Phan.* 295; O. Kuntze, *Rev. Gen.* II, 462.

Living species: 50±; tropical and subtropical regions and extra-tropical in N. America and Chile. N. America, 6-7; S. Sts., 5-6; E. Tex., 2; California, 1; W. Tex., 4.

Monniera rotundifolia MICHX. Fl. N. Am. II, 22 (1803).

Herpestis rotundifolia PURSH, Fl. Am. 418 (1814).

Ranapalus eiseni KELL. Proc. Acad. Calif. VII, 113 (1886).

Wats. and Coult., Gray's Man. 6 ed. 384; Chap., Suppl. S. St. 635; Gray, Syn. Fl. II, 1, 280; Suppl. Syn. II, 451; Coult., Fl. Tex. 310.

North America: Ill., Minn. and Mo. to Tenn., Tex., S. Car. and Ga.? Fresno Co., Calif.; Dak.

Minn. valley: Local in Lac Qui Parle Co.; wet places in prairies.

HERB.: *Moyer* 3, Cerro Gordo, Lac Qui Parle Co.; *Herb. Moyer* 170, Cerro Gordo, Lac Qui Parle Co.

XCVII. LENTIBULARIACEAE. Bladderwort Family.

Lindl., *Veg. King.* 686 (1846); Endlicher, *Gen. Pl.* 728 (1836-40); Benth. and Hooker, *Gen. Pl.* II, 986 (1876); Baillon, *Hist. Pl.* XI, 347, *Utriculariaceae* (1892).

Genera: 4; temperate and tropical regions; except in arid districts.

Species: 200±; 160±, in *Utricularia* alone.

UTRICULARIA LINN. Gen. 15 (1737).

Lentibularia VAILL. ex Durand l. c. (1888).

Akentra BENJ. Linn. XX, 319 (1846).

Diurospermum EDJW. Proc. Linn. Soc. 351 (1847).

Benth. and Hook., *Gen. Pl.* II, 987; Durand, *Ind. Gen. Phan.* 300; Baillon, *Hist. Pl.* XI, 352.

Living species: 160±; temperate and warmer regions; N. America, 15; Canada, 8; Rocky mts., 3; E. Sts., 12; S. Sts., 10; California, 3-4; Pl. King, 2; W. Texas, 6; Europe, 5; Russia, 3-4.

Utricularia cornuta MICHX. Fl. N. Am. I, 12 (1803).

U. personata LE CONTE, Ann. Lyc. N. Y. I, 73 (1824).

Wats. and Coult., Gray's Man. 6 ed. 397; Britt., Fl. N. J. 192; Mac., Fl. Can. I, 376; Upham, Fl. Minn. 98; Chap., Fl. S. St. 283; Gray, Syn. Fl. II, 1, 317 and Suppl. II, 455; Coult., Fl. Tex. 317.

Cuba and Brazil.

North America: Newf., Anticosti, N. S. to L. Superior reg. and Minn.; S. to N. J. and Fla.; W. to Iowa and Tex.

Minn. valley: Reported from N. E. district and N. edge; forest pools or lakes; floating or rooting in the mud.

Utricularia intermedia HAYNE, Schrad. Journ. I, 18 (1799).

U. millefolium NUTT. ex TORR. Fl. N. Y. II, 21 (1843).

Wats. and Coult., Gray's Man. 6 ed. 397; Britt., Fl. N. J. 191; Upham, Fl. Minn. 98; Mac., Fl. Can. I, 375, 573; Forbes and Hems., Fl. Sin. II, 223; Led., Fl. Ross. III, 2; Nym., Fl. Eur.; Hook., Fl. Gt. Brit. 312; Herd., Fl. Eur. Russ. 84; Gray, Syn. Fl. II, 1, 316; Hart., Fl. Scand. I, 123.

Northern Europe to Alps; N. Asia to Japan and China.

North America: Newf., Anticosti, N. S., N. Br., Ont. to S. Man., Brit. Col., Selkirks and Rockies; S. to Plumas Co., Calif.; S. to N. Eng. and N. J., and to Minn. and Iowa.

Minn. valley: S. and S. W. districts; rare; perhaps throughout forest district; floating on pools and lakes.

HERB.: *Sheldon 101*, Lake Custan, Le Sueur Co.

Utricularia minor LINN. Spec. 18 (1753).

U. estacea Hook. Fl. Bor.-Am. II, 118 (1840).

Wats. and Coult., Gray's Man. 6 ed. 396; Coult., Fl. Colo. 290; Webb., Fl. Neb. 138; Upham, Fl. Minn. 98; Brew. and Wats., Fl. Calif. I, 586; Mac., Fl. Can. I, 375, II, 348; Led., Fl. Ross. III, 2; Nym., Fl. Eur.; Hook., Fl. Gt. Brit. 312; Herd., Fl. Eur. Russ. 84; Wats., King Exp. 215; Gray, Syn. Fl. II, 315 and Suppl. Syn. II, 455; Hart., Fl. Scand. I, 123.

Europe, except Spain, Greece and Turkey; N. Africa; N. Asia to Ural and Altai Sib.

North America: Greenland to Saskatchewan, Brit. Col. and Prince Edward Isl.; S. in mts. to Nev. and Utah; S. to E. Mass. and N. J.; W. to Minn., Neb. and Ark.

Minn. valley: Forest district; infrequent; floating on quiet pools and lakes.

HERB.: *Roberts 94*, Duluth.

Utricularia vulgaris LINN. Spec. 18 (1753).

Wats. and Coult., Gray's Man. 6 ed. 396; Britt., Fl. N. J. 191; Upham,

Fl. Minn. 98; Webb., Fl. Neb. 138; Chap., Fl. S. St. 282; Coult., Fl. Colo. 290; Mac., Fl. Can. I, 375; Brew. and Wats., Fl. Calif. I, 586; Hook., Fl. Gt. Brit. 312; Nym. Fl. Eur.; Led., Fl. Ross. III, 1; Herd., Fl. Eur. Russ. 84; Wats., King Exp. 214; Cov., Fl. Ark 209; Gray, Syn. Fl. II, 315; Hart., Fl. Scand. I, 122; Coult., Fl. Tex. 317.

Most Europe; Russia; Siberia; Dahuria; N. Africa.

North America: Atl. to Pac. in Can. and far N. on Mackenzie; S. in Sierra Nevada to Calif.; in Rockies to N. Mex. and Tex.; E. throughout U. S.

Minn. valley: Forest district and perhaps throughout; floating on still pools or lakes.

HERB.: *Ballard* 679, Waconia; *Ballard* 435, Prior's lake, Scott Co.; *Ballard* 810, Page lake, Carver Co.; *Holzinger* 143, Winona Co.; *Sandberg* 396, Vasa; *Oestlund* 114, Minneapolis; *Roberts* 93, Stuart river; *Arthur* 62, Vermilion lake; *Reed* 1, Dakota Co.; *Sheldon* 346, Smith's Mill, Blue Earth Co.

XCVIII. OROBANCHACEAE. Broom-Rape Family.

Endlicher, *Gen. Pl.* 725 (1836-40); Bentham and Hooker, *Gen. Plant.* II, 980 (1876).

Genera: 11-12; extra-tropical regions and a few within the tropics.

Species: 175±; Europe, N. Africa, Asia and America.

APHYLLON MITCH. Act. Phys. Med. Cur. VIII, 221 (1748).

Gymnocaulis NUTT. Gen. II, 59 (1818).

Anoplanthus ENDL. p. p. Gen. 727 (1840).

Anoplon WALLR. ex Durand, l. c. (1888).

Phillipoea REUT. DC. Prodr. XI, 11 (1849) *Amer. Spec.*

Myzorrhiza PHILLIP. Linn. XXIX, 36 (1855).

Benth. and Hook., *Gen. Pl.* II, 983; Durand, *Ind. Gen. Phan.* 300.

Living species: N. America to Mexico, 10; Canada, 5; California, 6-7; S. Sts., 1; Rocky mts., 4; Pl. King, 2; Wheel.; 2; E. Sts., 3; W. Tex., 3.

Aphyllon ludovicianum (NUTT.) GRAY, Bot. Calif. I, 584 (1876).

Orobanche ludoviciana NUTT. Gen. II, 58 (1818).

Phelipoea ludoviciana WALP. Rep. III, 480 (1844-1845).

Wats. and Coult., Gray's Man. 6 ed. 395; Webb., Fl. Neb. 137; Upham, Fl. Minn. 98; Mac., Fl. Can. I, 373; Coult., Fl. Colo., 289; Gray, Syn. Fl. II, 1, 313 and Suppl. Syn. II, 455; Coult., Fl. Tex. 316.

North America: Saskatchewan, Assiniboia, Brit. Col., Vancouver; S. to Calif., N. Mex., Arizona and Tex.; E. to Minn. and Ill.

Minn. valley: Local in Nicollet Co.; root-parasitic in sandy ground.

Aphyllon fasciculatum (NUTT.) GRAY, Man. ed. 1, 290 (1848).

Orobanche fasciculata NUTT. Gen. II, 59 (1818).

Phelipoea fasciculata SPRENG. Syst. II, 218 (1825).

Anoplanthus fasciculatus WALP. Rep. III, 480 (1844-1845).

Wats. and Coult., Gray's Man. 6 ed. 395; Coult., Fl. Colo. 289; Upham, Fl. Minn. 98; Webb., Fl. Neb. 138; Brew. and Wats., Fl. Calif. I, 584; Roth., Wheel, Exp. 176, 217; Wats., King Exp. 215; Gray, Syn. Fl. II, 1, 312.

North America: Assiniboia to Brit. Col.; S. to Calif. and Arizona; E. to Minn., Mich. and Neb.

Minn. valley: S. W. districts; rooting on shrubs and herbs along ledges of granite; rare.

Aphyllon uniflorum (LINN.) GRAY, Man. ed. 1, 290 (1848).

Orobanche uniflora LINN. Spec. 882 (1753).

O. biflora NUTT. Gen. II, 59 (1818).

Wats. and Coult., Gray's Man. 6 ed. 394; Britt., Fl. N. J. 190; Webb., Fl. Neb. 138; Coult., Fl. Colo. 289; Mac., Fl. Can. I, 372; Chap., Fl. S. St. 287; Brew. and Wats., Fl. Calif. I, 584; Wats., King Exp. 215; Cov., Fl. Ark. 209; Gray, Syn. Fl. II, 1, 312; Coult., Fl. Tex. 316.

North America: Newf., N. Br., Ont., L. Superior reg., Brit. Col. to Vancouver; S. to N. Eng., N. J., Va. and Fla., W. to Minn., Neb. and Tex.; Pac. region to Calif.

Minn. valley: N. E. district; woods; rare; a root-parasite.

HERB.: *Kassube* 159, Minneapolis.

XCIX. PLANTAGINACEAE. Plantain Family.

Endlicher, *Gen. Pl.* 346 (1836-40); Bentham and Hooker, *Gen. Plant.* II, 1223 (1876); Baillon, *Hist. Pl.* IX, 274 (1888).

Genera: 3; cosmopolitan.

Species: 150-175; all but two in *Plantago*.

PLANTAGO LINN. Gen. 77 (1737).

Benth. and Hook., *Gen. Pl.* II, 1224; Durand, *Ind. Gen. Phan.* 330; Baillon, *Hist. Pl.* IX, 279.

Living species: 200+ described; to be reduced; cosmopolitan. Europe, 43; Russia, 27; European Russia, 10; N. America, 15; S. Sts., 10; Rocky mts., 4-5; E. Sts., 10; Canada, 11-12; Calif. and Pac. coast, 10; Pl. King, 4; Pl. Wheel., 2; W. Tex., 5.

Plantago patagonica JACQ. var. **gnaphalioides** (NUTT.) GRAY, Syn. Fl. II, 1, 391 (1886).

P. gnaphalioides NUTT. Gen. I, 100 (1818).

P. lagopus PURSH, Fl. 99 (1814) *not* Linn.

P. purshii R. and S. Syst. III, 120 (1818).

P. hookeriana F. and M. Ind. Sem. Petrop. (1838).

Wats. and Coult., Gray's Man. 6 ed. 424; Mac., Fl. Can. I, 393; Webb., Fl. Neb. 140; Upham, Fl. Minn. 96; Coult., Fl. Colo. 300; Brew. and Wats., Fl. Calif. I, 611 (spec.); Roth., Wheel. Exp. 225; Wats., King Exp. 213; Cov., Fl. Ark. 213; Gray, Syn. Fl. II, 1, 391; Coult., Fl. Tex. 344.

North America: Saskatchewan, Assiniboia to S. Brit. Col.; S. to Calif. and Tex.; E. to Neb., Ark., Ind., Minn. and Ky.

Minn. valley: Prairie districts especially in rocky regions; on high, sterile knolls or ledges.

HERB.: *Sheldon* 436, Smith's Mills, Blue Earth Co.; *Sheldon* 214, New Ulm; *Ballard* 241, Jordan, Scott Co.; *Taylor* 177, Janesville; *Sheldon* 1445, Pipestone City; *Leiberg* 49, Blue Earth Co.; *Leiberg* 50, Blue Earth Co.; *Herb. Moyer* 177, Rock Cut, near Montevideo.

***Plantago rugelii* DECN. DC. Prodr. XIII, 695 (1849).**

P. major ELL. Sk. I, 201 (1821).

P. kamtschatica Hook. Comp. Bot. Mag. II, 61 (1835).

Wats. and Coult., Gray's Man. 6 ed. 423; Britt., Fl. N. J. 203; Upham, Fl. Minn. 96; Webb., Fl. Neb. 140; Mac., Fl. Can. I, 392, 574; Chap., Fl. S. St. 277; Cov., Fl. Ark. 213; Gray, Syn. Fl. II, 1, 390; Coult., Fl. Tex. 344.

North America: Q., Ont. to Vt., Minn. and Neb.; S. to Ga., Ark. and Tex.

Minn. valley: Forest district and N. W.; banks of streams and lakes.

HERB.: *Ballard* 270, Jordan, Scott Co.; *Herrick* 219, Minneapolis; *Leiberg* 48, Blue Earth Co.

***Plantago major* LINN. Spec. 113 (1753).**

P. major var. *minima* DECN. DC. Prodr. XIII, 695 (1849).

Wats. and Coult., Gray's Man. 6 ed. 423; Britt., Fl. N. J. 203; Coult., Fl. Colo. 299; Upham, Fl. Minn. 96; Webb., Fl. Neb. 140; Chap., Fl. S. St. 277; Brew. and Wats., Fl. Calif. I, 611; Mac., Fl. Can. I, 391; Led., Fl. Ross. III, 476; Hook., Fl. Gt. Brit. 288; Nym., Fl. Eur.; Griseb., Fl. W. I; Miyabe, Fl. Kur. 256 *in var.*; Herd., Fl. Eur. Russ. 106; Roth., Wheel. Exp. 225; Cov., Fl. Ark. 213; Gray, Syn. Fl. II, 1, 389; Hart., Fl. Scand. I, 132; Coult. Fl. Tex. 344.

N. Africa; Europe; N. and W. Asia to China?

North America: L. Superior to Brit. Col.; S. to Minn. and Oregon; intro. from W. Europe in E. U. S. and adventive also in W. Indies, Brazilian and other S. American ports.

Minn. valley: Throughout; moist soil, door-yards, roadsides and edges of streams.

HERB.: *Sheldon* 875, Sleepy Eye; *Taylor* 367½, Janesville; *Taylor* 691, Minnesota lake; *Taylor* 164, Janesville; *Ballard* 513, Prior's lake, Scott Co.; *Sheldon* 873, Sleepy Eye; *Ballard* 681, Waconia. (The last two are perhaps var. *asiatica* Decn.); *Oestlund* 230, Hennepin Co.; *Sandberg* 422, Cannon Falls; *Oestlund* 131, Minneapolis; *Bailey* 258a, St. Louis river; *Sandberg* 423, Goodhue Co.; *Ballard* 998, St. Paul; *Herb. Sheld.* 187, Minneapolis; *Herb. Moyer* 176, Montevideo.

C. RUBIACEAE. Madder Family.

Endlicher, *Gen. Pl.* 520 (1836-40); Lindl., *Veg. King.* 761 (1846)—*Cinchonaceae*; Lindl., l. c. 768 (1846)—*Galiaceae*; Bentham and Hooker, *Gen. Plant.* II, 7 (1873); Baillon, *Hist. Pl.* VII, 257 (1880); Schumann in Engler and Prantl, *Nat. Pflanz.* IV, 4, 1 (1891):

Genera: 300±; tropical regions; sparingly in temperate zones; N. rather than S. and particularly in W. hemisphere; 343 gen. (*Schumann*); 197 (*Baillon*); 337 (*B.* and *H.*).

Species: 4500±, a few temperate or circumpolar.

HOUSTONIA LINN. Gen. 70 (1737).

Baillon, *Hist. Pl.* VII, 326 (sub *Oldenlandia* Linn.); Benth. and Hook., *Gen. Pl.* II, 60; Durand, *Ind. Gen. Phan.* 174; Engler and Prantl, *Nat. Pflanz.* IV, 4, 27 (*Schumann*).

Living species: 20±; W. N. America and Mexico. E. Sts., 6-7; S. Sts. 6; W. Tex., 10.

Houstonia purpurea LINN. var. **ciliolata** (TORR.) GRAY, *Man.* 5 ed. 212 (1867).

H. ciliolata TORR. *Fl. U. S. I.* 174 (1824).

Hedyotis ciliolata TORR. Spreng. *Syst. Cur. Post.* 40 (1827).

Wats. and Coult., *Gray's Man.* 6 ed. 223; Mac., *Fl. Can.* I, 199; Upham, *Fl. Minn.* 68; Gray, *Syn. Fl.* I, 2, 26; Coult., *Fl. Tex.* 159?

North America: Ont., Niagara river and L. Huron to Minn. and Ky.

Minn. valley: Reported from N. edge; infrequent; woods and banks.

HERB.: ? *Sandberg* 264, Moose lake; *Sandberg* 265, N. Pac. Junction.

Houstonia purpurea LINN. var. **longifolia** (GAERTN.) GRAY, *Man.* 5 ed. 212 (1867).

H. longifolia GAERTN. *Fruct. I.* 226 (1788).

H. angustifolia PURSH, *Fl. Am.* 106 (1814) *in part.*

Hedyotis longifolia HOOK. *Fl. Bor.-Am.* I, 286 (1833).

Oldenlandia purpurea var. *longifolia* CHAPM. *Fl. S. St.* 2 ed. 181 (1887).

Wats. and Coult., *Gray's Man.* 6 ed. 223; Britt., *Fl. N. J.* 125; Mac., *Fl.*

Can. 1, 200, 540; Upham, Fl. Minn. 67; Cov., Fl. Ark. 188; Engl. Schumann, Nat. Pflanz. IV, 4, 27; Gray, Syn. Fl. I, 2, 26; Coult., Fl. Tex. 159.

North America: Ont. to Man. and Assiniboia.; N. W. T.; S. to Maine, N. J., and Ga.; W. to Minn., Mo., Ark. and Tex.

Minn. valley: Throughout; woods and banks of streams.

HERB.: *Sheldon* 1222, Red Stone, near New Ulm; *Ballard* 279, Jordan, Scott Co.; *Bailey* 474, Agate bay; *Gedge* 6, Granite Falls; *Roberts* 56, Kettle river; *Sheldon* 1622, Taylor's Falls; *MacM.* and *Sheld.* 20, Brainerd, *Herb. Moyer* 104, Granite Falls; 105, Montevideo.

GALIUM LINN. Gen. 65 (1737).

Aparine LINN. Gen. 64 (1737).

Microphysa SCHRENK. Bull. Acad. Petr. II, 115 (1860).

Baillon, *Hist. Pl.* VII, 259 (sub *Rubia* Linn.); Benth. and Hook., *Gen. Pl.* II, 149; Durand, *Ind. Gen. Phan.* 186; Schenck, *Palaeophyt.* 785.

Living species: 300 described; 175 distinct. Russia, 50; Europe, 100; Russian Europe, 20; North America, 35; Canada, 15; Rocky mts., 6-7; S. Sts., 9; California, 13; E. Sts., 13; Pl. King, 8; Pl. Wheel., 4; W. Tex., 9; all temperate and warmer regions.

Fossil species: 1; Greenland, Tertiary (*Heer*).

Galium triflorum MICHX. Fl. N. Am. I, 80 (1803).

G. suaveolens WAHL. Fl. Lapp. 48 (1812).

G. cuspidatum MUHL. Cat. 15 (1813).

G. brachiatum PURSH, Fl. Am. 103 (1814).

G. pennsylvanicum BART. Fl. Phil. 83 (1818).

Wats. and Coult., Gray's Man. 6 ed. 227; Britt., Fl. N. J. 126; Mac., Fl. Can. I, 202; Chap., Fl. S. St. 174; Coult., Fl. Colo. 127; Webb., Fl. Neb. 142; Wats., Fl. Calif. II, 284; Upham, Fl. Minn. 67; Nym., Fl. Eur.; Led., Fl. Ross. II, 413; Herd., Fl. Eur. Russ. 62; Wats., King. Exp. 135; Cov., Fl. Ark. 188; Gray, Syn. Fl. I, 2, 39; Hart., Fl. Scand. I, 65.

Europe; Asia to Japan.

North America: Atl. to Pac. in Can.; to lat. 58° N. on Peace river; S. to N. Eng., Fla. and Miss.; W. to Minn., Neb., Colo. and Calif.

Minn. valley: Throughout; woods and along river banks; rare far W.; rich woods.

HERB.: *Ballard* 332, Belle Plaine; *Ballard* 699, Waconia; *Taylor* 822, Glenwood; *Taylor* 237, Janesville; *Sheldon* 234, Lake Washington, Le Sueur Co.; *Sheldon* 809, Sigel township, Brown Co.; *Oestlund* 82, Hennepin Co.; *Bailey* 330, St. Louis river; *Bailey* 210, Vermilion lake; *Bailey* 505, Agate bay; *Roberts* 55, Duluth; *Bailey* 44, Vermilion lake; *Sandberg* 261, Chisago Co.

Galium asprellum MICHX. Fl. N. Am. I, 78 (1803).*G. pennsylvanicum* MUHL. Cat. 15 (1813).*G. spinulosum* RAF. Prec. Decouv. 40 (1814).*G. micranthum* PURSH, Fl. Am. 103 (1814) *in part*.

Wats. and Coult., Gray's Man. 6 ed. 227; Britt., Fl. N. J. 126; Mac., Fl. Can. I, 201; Webb., Fl. Neb. 142; Upham, Fl. Minn. 67; Trautv., Fl. Sib. 63 *in var.*; Forbes and Hems., Fl. Sin. 393; Gray, Syn. Fl. I, 2, 39.

E. Sib.; Japan; Manchuria.

North America: N. S., N. Br., Q., Ont. to N. Eng., N. J. and N. Car.; W. to Man., Minn., Neb. and Mo.

Minn. valley: Throughout; damp thickets or edges of wooded swamps.

HERB.: *Taylor* 234, Janesville; *Arthur* 72, Vermilion lake; *Sandberg* 258, Goodhue Co.; *Herrick* 133, Minneapolis; *Bailey* 356, Mud river.

Galium concinnum T. and G. Fl. II, 23 (1841).*? G. parviflorum* RAF. Med. Repos. V, 360 (1808).

Wats. and Coult., Gray's Man. 6 ed. 227; Britt., Fl. N. J. 126; Upham, Fl. Minn. 67; Webb., Fl. Neb. 142; Cov., Fl. Ark. 188; Gray, Syn. Fl. I, 2, 38.

North America: N. J., Penn. to Va.; W. to Minn., Neb. and Ark.

Minn. valley: Forest district to Cottonwood valley and N. W. district; dry places in woods or thickets.

HERB.: *Taylor* 626, Minnesota lake; *Sheldon* 241, Turtle lake, Le Sueur Co.; *Ballard* 299, Jordan, Scott Co.; *Sheldon* 651, Waseca; *Ballard* 236, Jordan, Scott Co.; *Taylor* 439, Janesville; *Sheldon* 296, Madison Lake; *Sheldon* 747, Sleepy Eye; *Herrick* 134, Minneapolis.

Galium trifidum LINN. Spec. 105 (1753).*G. tinctorium* LINN. Spec. 106 (1753).*G. claytoni* MICHX. Fl. I, 78 (1803).

Wats. and Coult., Gray's Man. 6 ed. 227; Britt., Fl. N. J. 126; Upham, Fl. Minn. 67; Mac., Fl. Can. I, 201, 540; Coult., Fl. Colo. 128; Wats., Fl. Calif. II, 284; Chap., Fl. S. St. 174; Webb., Fl. Neb. 142; Nym., Fl. Eur.; Led., Fl. Ross. II, 409; Herd., Fl. Eur. Russ. 62; Wats., King Exp. 135; Roth., Wheel. Exp. 138; Cov., Fl. Ark. 188; Gray, Syn. Fl. I, 2, 38; Hart., Fl. Scand. I, 65; Coult., Fl. Tex. 162.

Europe; Siberia, Dahuria and Japan.

North America: Atl. to Pac. in Can. and N. to 68° N. lat.; throughout U. S. to Fla., Tex. and Arizona; Alaska and Aleutian Islands.

Minn. valley: Throughout; swamps and wet woodland regions.

HERB.: *Taylor* 1037, Glenwood; *Ballard* 800, Goose lake, Carver Co.; *Ballard* 674, Waconia; *Sheldon* 338, Smith's

Mills, Blue Earth Co.; *Ballard* 66, Chaska; *Taylor* 124, Janesville; *Taylor* 146a, Janesville; *Sheldon* 524, Waseca; *Sheldon* 291, Madison Lake; *Sheldon* 245, Turtle lake, Le Sueur Co.; *Sheldon* 31, Elysian; *Leonard* 21, Spring Valley; *Sandberg* 259, Red Wing; *Kassube* 118, St. Anthony; *Bailey* 297, St. Louis river; *Holzinger* 105, Winona Co.; *Bailey* 73, Vermilion lake; *Herrick* 135, Minneapolis; *Bailey* 275, St. Louis river; *Sandberg* 260, Goodhue Co.; *Herb. Sheld.* 1713, Minneapolis; 1762, Ft. Snelling.

***Galium trifidum* var. *latifolium* TORR.** Fl. U. S. 165 (1824).

G. obtusum BIGEL. Fl. Bost. ed. II, 55 (1824).

G. trifidum LINN. var. *obtusum* (BIGEL.) MacM. MSS. (1891).

Wats. and Coult., Gray's Man. 6 ed. 227; Britt., Fl. N. J. 126; Webb., Fl. Neb. 142; Mac., Fl. Can. I, 201; Chap., Fl. S. St. 174; Upham, Fl. Minn. 67; Gray, Syn. Fl. I, 2, 38; Coult., Fl. Tex. 162.

North America: N. Br., Q., Ont. to N. J. and Fla.; W. to Minn., Dak., Neb., Colo. and Tex.

Minn. valley: N. E. and N. W. districts; local; swampy ground and wooded marshes.

HERB.: *Taylor* 996, Glenwood; *Ballard* 84, Chaska, and 165, Chaska.

***Galium boreale* LINN.** Spec. 108 (1753).

G. bermudianum MUHL. Cat. (1813).

G. septentrionale R. and S. Syst. III, 253 (1818).

G. strictum TORR. Pl. N. Y. 23 (1819).

G. rubioides Auct. Amer.

Wats. and Coult., Gray's Man. 6 ed. 227; Mac., Fl. Can. I, 203; Britt., Fl. N. J. 127; Hook., Fl. Gt. Brit. 194; Wats., Fl. Calif. II, 285; Webb., Fl. Neb. 142; Upham, Fl. Minn. 67; Coult., Fl. Colo. 127; Trautv., Fl. Sib. 64?; Led., Fl. Ross. II, 412; Nym., Fl. Eur.; Forbes and Hems., Fl. Sin. 393; Herd., Fl. Eur. Russ. 62; Roth., Wheel. Exp. 138; Wats., King Exp. 136; Gray, Syn. Fl. I, 2, 38; Hart., Fl. Scand. I, 65.

N. and C. Europe to Bosnia; Russ. to Caucasus; Siberia, Dahuria and China.

North America: Q., Ont. to Rockies and 68° N. lat.; S. to Maine, N. J. and Penn.; W. to Minn., Neb., Mont., Colo., N. Mexico, Calif., Oregon and along Pac. coast to Sitka.

Minn. valley: Throughout; abundant; banks of streams and shores of lakes.

HERB.: *Sheldon* 1291, Lake Benton; *Ballard* 108, Carver; *Ballard* 422, New Prague, Scott Co.; *Sheldon* 227, Lake Washington, Le Sueur Co.; *Sheldon* 277, Madison Lake; *Sheldon* 743, Sleepy Eye; *Taylor* 84, Elysian; *Taylor* 235, Janesville; *Taylor* 576, Minnesota lake; *Taylor* 116, Janesville; *Taylor* 867, Glenwood; *Sheldon* 1179, New Ulm; *Leonard* 22, Wikoff; *Leonard* 23, Minneapolis; *Holzinger* 106, Winona Co.; *Kassube*

119, Minneapolis; *Holzinger* 107, Winona Co.; *Sandberg* 263, Red Wing; *Hammond* 22, Lake City; *Herb. Sheld.* 1769, Ft. Snelling; *Herb. Moyer* 103, Montevideo.

***Galium lanceolatum* TORR.** Fl. U. S. 168 (1824).

G. torreyi BIGEL. Fl. Bost. 2 ed. 56 (1824).

G. circaeazans var. *lanceolatum* T. and G. Fl. II, 24 (1841).

Wats. and Coult., Gray's Man. 6 ed. 226; Britt., Fl. N. J. 127; Mac., Fl. Can. I, 202; Upham, Fl. Minn. 67; Chap., Fl. S. St. 174; Gray, Syn. Fl. I, 2, 37.

North America: Q., Ont., N. Eng. to N. J., Penn., N. Car. and Tenn.; W. to Minn. and Neb.

Minn. valley: Reported from E. edge; rare; woods.

HERB.: *Sandberg* 262, Cannon Falls.

***Galium circaeazans* MICHX.** Fl. N. Am. I, 80 (1803).

G. brachiatum MUHL. Cat. 15 (1813).

G. circaeoides R. and S. Syst. III, 256 (1818).

Wats. and Coult., Gray's Man. 6 ed. 226; Britt., Fl. N. J. 127; Webb., Fl. Neb. 142; Chap., Fl. S. St. 174; Mac., Fl. Can. I, 202; Upham, Fl. Minn. 67; Cov., Fl. Ark. 188; Gray, Syn. Fl. I, 2, 37; Coult., Fl. Tex. 162.

North America: Q., Ont. to N. Eng., N. J. and Fla.; W. to Dak., Neb., Ark. and Tex.

Minn. valley: Reported from S. E. edge, but no Minn. specimens seen.

***Galium aparine* LINN.** Fl. Dan. 495 (1757).

Wats. and Coult., Gray's Man. 6 ed. 226; Britt., Fl. N. J. 127; Mac., Fl. Can. I, 200; Webb., Fl. Neb. 142; Hook., Fl. Gt. Brit. 194; Coult., Fl. Colo. 127; Wats., Fl. Calif. II, 284; Nym., Fl. Eur.; Led., Fl. Ross. II, 419; Forbes and Hems., Fl. Sin. 393; Herd., Fl. Eur. Russ. 62; Wats., King Exp. 134; Cov., Fl. Ark. 188; Gray, Syn. Fl. I, 2, 36; Hart., Fl. Scand. I, 67; Coult., Fl. Tex. 163.

All Europe to Caucasus; Sib., Dahuria, China, Japan.

North America: N. Br., N. S., Q., Ont. to Vancouver, Alaska and Aleutian Isls.; S. to Calif. and Tex.; E. throughout U. S.; forms E. of the Mississippi are probably introduced from W. Europe.

Minn. valley: Forest district and to Chippewa valley; moist woods and copses.

HERB.: *Ballard* 232, Jordan, Scott Co.; *Ballard* 49, Chaska; *Kassube* 117, Minneapolis; *Holtz.* 25, Minnehaha; *Herb. Moyer* 102, Montevideo.

CI. CAPRIFOLIACEAE. Honeysuckle Family.

Lindl., *Veg. King.* 766 (1846); Endlicher, *Gen. Pl.* 566 (1836-40)—*Lonicereae*; Bentham and Hooker, *Gen. Plant.* II, 1 (1873; Baillon, *Hist. Pl.* VII, 497 (1880)—sub *Rubiaceae*.

Genera: 12; N. hemisphere and Australia and S. America; most in temperate regions.

Species: 200–250; principally shrubs and small trees.

LINNAEA GRONOV. Linn. Gen. 525 (1737).

Obolaria SIEG. Prim. 79 (1736).

Abelia R. BR. Clarke's Abel. Chin. App. 376 (1818).

Vesalea MART. and GAL. Bull. Brux. XI, 242 (1843).

Baillon, *Hist. Pl.* VII, 501; Benth. and Hook., *Gen. Pl.* II, 4, 5; Durand, *Ind. Gen. Phan.* 169, 170.

Living species: Two well marked sections, *Abelia*, 10; *Linnaea*, 1; N. boreal and temperate regions to the Himalayas, China and Mexico. N. America, 1.

Linnaea borealis LINN. Spec. 631 (1753).

Wats. and Coult., Gray's Man. 6 ed. 219; Britt., Fl. N. J. 123; Coult., Fl. Colo. 124; Wats., Fl. Calif. II, 278; Upham, Fl. Minn. 64; Mac., Fl. Can. I, 195, 539; Trautv., Fl. Sib. 63; Hook., Fl. Gt. Brit. 191; Nym., Fl. Eur.; Led., Fl. Ross. II, 392; Gray, Syn. Fl. I, 2, 13; Forbes and Hems., Fl. Sin. 359; Miyabe, Fl. Kur. 238; Herd., Fl. Eur. Russ. 62; Roth., Wheel. Exp. 136; Wats., King Exp. 132; Hart., Fl. Scand. I, 69.

W. Europe to C. Asia, Amurland, Corea, China, Japan (Yezo), Kamtk. and Kuriles; N. to Scotland, Lapland and Siberia.

North America: Atl. to Pac. in Can.; N. in Arctic circle; S. to N. Eng., N. J., Penn., Md.; W. to Minn., Dak., Colo., Mont., Oregon and Calif.

Minn. valley: Reported N. E. districts, S. of Lake Minnetonka; doubtless in N. W. district with *Cornus canadensis*; mossy woods.

HERB.: *Roberts* 50, French river; *Roberts* 51, Duluth; *Herrick* 125, St. Louis river; *Bailey* 48, Vermilion lake; *Juni* 6, N. shore, Lake Superior; *Sandberg* 241, Tower.

SYMPHORICARPOS JUSS. Gen. 211 (1789).

Symphoria PERS. Syn. I, 214 (1805).

Anisanthus WILLD. Rel. R. and S. Syst. V, XIV (1819).

Symphoricarpa NECK. Elem. 220 (1790).

Baillon, *Hist. Pl.* VII, 498; Benth. and Hook., *Gen. Pl.* II, 4; Durand, *Ind. Gen. Phan.* 169.

Living species: 6±, N. America and mountains of Mexico; Canada, 3–4; E. Sts., 3; California, 4–5; S. Sts., 1; Rocky mts., 3–4; Pl. King, 2; Pl. Wheel., 2; W. Tex., 3.

Symphoricarpos racemosus MICHX. Fl. N. Am. I, 107 (1803).

Symphoria racemosa PERS. Syn. I, 214 (1805).

Xylosteum ciliatum var. *album* PURSH, Fl. Am. 161 (1814).

Symphoricarpos elongata PRESL, DC. Prodr. IV, 338 (1830).

S. heterophylla PRESL, DC. Prodr. IV, 338 (1830).

Wats. and Coult., Gray's Man. 6 ed. 220; Britt., Fl. N. J. 123; Coult., Fl. Colo. 125; Upham, Fl. Minn. 65; Mac., Fl. Can. I, 196; Wats., Fl. Calif. I, 279; Gray, Syn. Fl. I, 2, 13.

North America: N. S., N. Br., Q., Ont. to N. Eng. N. J. and Penn.; W. to Minn., Colo., Calif. and Oregon, Brit. Col. and Rockies?

Minn. valley: N. E. district, and perhaps N. W.; edges of thickets and woods.

HERB.: *Kassube* 111, Minneapolis; *Sandberg* 243, Cannon Falls; *Herb. Sheld.* 1689, Minneapolis.

***Symphoricarpos racemosus* MICHX. var. *pauciflorus* ROBINS.** Gray's Man. 5 ed. 203 (1867).

Wats. and Coult., Gray's Man. 6 ed. 220; Webb., Fl. Neb. 142; Mac., Fl. Can. I, 196, 539; Coult., Fl. Colo. 125; Upham, Fl. Minn. 65; Gray, Syn. Fl. I, 2, 14.

North America: Ont. to N. W. T., Man., Rockies, Brit. Col. and Vancouver; S. to N. Y., Penn.; W. to Minn., Wisc., Mont., Oregon and Colo.

Minn. valley: Forest district to Redwood river; rare and local; edges of thickets and woods.

HERB.: *Bailey* 65, Vermilion lake; *Holzinger* 100, Winona Co.; *Bailey* 415, Burntside lake; *Herb. Sheld.* 1868, Minneapolis; *Herb. Sheld.* 1867, Ramsey Co.

***Symphoricarpos occidentalis* (R. BR.) HOOK.** Fl. Bor.-Am. I, 285 (1833).

Symphoria occidentalis R. BR. Rich. App. Frankl. Journ. (1824).

Wats. and Coult., Gray's Man. 6 ed. 220; Webb., Fl. Neb. 142; Mac., Fl. Can. I, 195; Coult., Fl. Colo. 125; Upham, Fl. Minn. 65; Gray, Syn. Fl. I, 2, 13.

North America: Man. to Rocky mts. and N. to lat 64°; S. to N. Mich., Wisc., Minn., Ill., Neb., Colo. and Mont.

Minn. valley: Throughout; edges of woods and thickets.

HERB.: *Ballard* 313, Belle Plaine; *Taylor* 759, Glenwood; *Ballard* 171, Shakopee; *Taylor* 619, Minnesota lake; *Taylor* 759a, Glenwood; *Sheldon* 1101, Springfield; *Sheldon* 365, Madison Lake; *Sheldon* 273, Madison Lake; *Sheldon* 57, Elysian; *Sheldon* 774, Sleepy Eye; *Taylor* 32, Elysian; *Herrick* 126, Minneapolis; *Oestlund* 80, Hennepin Co.; *Kassube* 110, Minneapolis; *Holzinger* 99, Hamilton; *Sandberg* 242, Cannon Falls.

Symphoricarpos symphoricarpos (LINN.) MACM. Torr.
Bull. XIX, 15 (1892).

Lonicera symphoricarpos LINN. Spec. 175 (1753).

Symphoricarpos orbiculatus MOENCH, Meth. 491 (1794).

S. vulgaris MICHX. Fl. N. Am. I, 106 (1803).

Symphoria conglomerata PERS. Syn. I, 214 (1805).

Symphoricarpos glomerata PURSH, Fl. Am. 162 (1814).

S. parviflora DESF. Cat. (1829).

Wats. and Coult., Gray's Man. 6 ed. 220; Webb., Fl. Neb. 142; Upham, Fl. Minn. 65; Britt., Fl. N. J. 123; Chap., Fl. S. St. 169; Cov., Fl. Ark. 187; Gray, Syn. Fl. I, 2, 13; Coult., Fl. Tex. 156.

North America: N. Y., Penn., N. J.; W. to Minn., Dak., Neb., Ark. and Tex.; N. Car. in mts.

Minn. valley: Forest district to Chippewa valley and N. W. districts; banks and rocky woods.

HERB.: *MacMillan* 9, Glenwood; *Taylor* 438, Lake Helena, Waseca Co.; *Oestlund* 81, Minneapolis; *Herb. Sheld.* 1745, Minneapolis; *Herb. Moyer* 96, Montevideo.

LonicerA LINN. Gen. 162 (1737).

Caprifolium TOURN. Inst. 608 (1700).

Xylosteum TOURN. l. c. 609 (1700).

Nintooa SWEET, Hort. Brit. ed. II, 258 (1830).

Baillon, *Hist. Pl.* VII, 499; Benth. and Hook., *Gen. Pl.* II, 5; Durand, *Ind. Gen. Phan.* 170; Schenck, *Palaeophyt.* 788.

Living species: 100±; temperate and tropical regions of the N. hemisphere. Russia, 15; Europe, 19; Russian Europe, 5; North America, 20; Canada, 11; E. Sts., 9; Rocky mts., 3; S. Sts., 4; California, 7; Pl. King, 3; Pl. Wheel., 1; W. Tex., 2.

Fossil species: Upper Miocene of Oeningen (*Heer*); doubtful.

Lonicera glauca HILL, Hort. Kew. 446 (1768).

L. dioica LINN. Syst. Veg. 215 (1774).

L. media MURR. Comm. Gött. (1776).

L. parviflora LAM. Enc. Meth. I, 728 (1783).

Caprifolium glaucum MOENCH, Meth. 502 (1794).

C. bracteosum MICHX. Fl. N. Am. I, 105 (1803).

C. parviflorum PURSH, Fl. Am. 161 (1814).

C. dioicum R. and S. Syst. V, 216 (1819).

Lonicera douglasii DC. Prodr. IV, 332 (1830).

Wats. and Coult., Gray's Man. 6 ed. 221; Britt., Fl. N. J. 124; Mac., Fl. Can. I, 197, 539; Webb., Fl. Neb. 142; Chap., Fl. S. St. 170; Upham, Fl. Minn. 65; Cov., Fl. Ark. 187; Gray, Syn. Fl. I, 2, 17.

North America: Man., Saskatchewan, Hudson Bay, N. W. T. to Montreal; Brit. Col. and Rockies; S. to N. Eng., N. J., Penn.; W. to Minn. Dak. and Neb.

Minn valley: Throughout and abundant; rocky banks and edges of woods.

HERB.: *Sheldon* 235, Lake Washington, Blue Earth Co.; *Ballard* 684, Waconia; *Taylor* 37, Elysian; *Sheldon* 801, Sigel township, Brown Co.; *Taylor* 37a, Elysian; *Sheldon* 509, Waseca; *Ballard* 229, Jordan, Scott Co.; *Ballard* 386, Jordan, Scott Co.; *Taylor* 908, Glenwood; *Herrick* 127, St. Louis river; *Leiberg* 25, Blue Earth Co.; *Sandberg* 245, Cannon Falls; *Holzinger* 101, Winona bluffs; *Sandberg* 246, Red Wing; *Herb. Wickersheim* 57, Mankato; *Herb. Moyer* 97, Montevideo.

***Lonicera sullivantii* GRAY**, Proc. Am. Acad. XIX, 76 (1883).

L. douglasii HOOK. Fl. Bor.-Am. I, 282 (1833).

L. flava var. *B. T.* and *G.* Fl. II, 6 (1841).

L. flava GRAY, Man. 5 ed. 204 (1867) chiefly.

Wats. and Coult., Gray's Man. 6 ed. 221; Mac., Fl. Can. I, 197; Upham, Fl. Minn. 65; Webb., Fl. Neb. 142; Chap., Fl. S. St. 170; Cov., Fl. Ark. 187; Gray, Syn. Fl. I, 2, 17.

North America: Assiniboia and Man. to Minn., Neb., Ill., Ohio, Ark., Tenn. and N. Car.

Minn. valley: Reported from N. E. district and E. edge; rare or local; rocky woods or banks.

HERB.: *Sandberg* 244, Vasa.

***Lonicera ciliata* MUHL.** Cat. 22 (1813).

Vaccinium album LINN. Spec. 350 (1753) *sp. Kalm.*

Xylosteum tartaricum MICHX. Fl. N. Am. I, 106 (1803).

X. ciliatum PURSH, Fl. Am. 161 (1814).

Lonicera canadensis R. and S. Syst. V, 260 (1819).

Caprifolium ciliatum OK. Rev. Gen. I, 274 (1891).

Wats. and Coult., Gray's Man. 6 ed. 220; Britt., Fl. N. J. 124; Mac., Fl. Can. I, 197; Upham, Fl. Minn. 65; Gray, Syn. Fl. I, 2, 15.

North America: N. S., N. Br., Q., Ont. to N. Eng., N. J. and Penn.; W. to Minn., Saskatchewan and Brit. Col.

Minn. valley: Reported from N. E. district; rare; rocky banks and woods.

HERB.: *Roberts* 52, Duluth; *Herrick* 128, St. Louis river; *Bailey* 243, Vermilion lake; *Sandberg* 247, Cannon Falls.

***DIERVILLA* LINN.** Gen. 150 (1737).

Weigela THUNB. Act. Holm. 135 (1780).

Weigelia PERS. Syn. I, 176 (1805).

Calysphyrum BUNGE, Enum. Pl. Chin. 33 (1831).

Calyplostigma TRAUTV. and MEY. Midd. Reise Okh. (1847).

Baillon, *Hist. Pl.* VII, 497; Benth. and Hook., *Gen. Pl.* II, 6; Durand, *Ind. Gen. Phan.* 170.

Living species: $7\pm$; E. North America, China and Japan; N. America, 2; Canada, 1; S. Sts., 2; E. Sts., 1.

Diervilla diervilla (LINN.) MACM. Torr. Bull. XIX, 15 (1892).

Lonicera diervilla LINN. Spec. 175 (1753).

Diervilla trifida MOENCH, Meth. 492 (1794).

D. tournefortii MICHX. Fl. N. Am. I, 107 (1803).

D. humilis PERS. Syn. I, 214 (1805).

D. canadensis WILLD. Enum. 222 (1809).

D. lutea PURSH, Fl. Am. 162 (1814).

Wats. and Coult., Gray's Man. 6 ed. 222; Britt., Fl. N. J. 124; Upham, Fl. Minn. 65; Mac., Fl. Can. I, 198, 540; Gray, Syn. Fl. I, 2, 18.

North America: Newf., Anticosti, N. S., N. Br., Ont. to N. J. and mts. of N. Car.; W. to Minn., Ky.; Hudson Bay to Rockies.

Minn. valley: Forest district, infrequent; rocky places.

HERB.: *Roberts* 53, Poplar river; *Kassube* 112; Minneapolis; *Roberts* 54, Duluth; *Herrick* 129, Minneapolis; *Bailey* 167, Vermilion lake; *Sandberg* 248, Cannon Falls; *Gedge* 4, Riverton; *Holtz* 16, Hennepin Co.

TRIOSTEUM LINN. Gen. ed. V, 211 (1754).

Baillon, *Hist. Pl.* VII, 500; Benth. and Hook, *Gen. Pl.* II, 4; Durand, *Ind. Gen. Phan.* 169.

Living species: 3; 2, North America; 1, Himalayas; Canada, 1; E. Sts., 2; S. Sts., 2.

Triosteum perfoliatum LINN. Spec. 176 (1753).

T. majus MICHX. Fl. N. Am. I, 107 (1803).

Wats. and Coult., Gray's Man. 6 ed. 219; Britt., Fl. N. J. 123; Webb., Fl. Neb. 142; Mac., Fl. Can. I, 199, 540; Upham, Fl. Minn. 66; Chap., Fl. S. St. 170; Cov., Fl. Ark. 187; Gray, Syn. Fl. I, 2, 12.

North America: Q., Ont. to N. Eng., N. J. and Alab.; W. to Minn., Neb. and Ark.

Minn. valley: Forest district; woods and shaded banks of rivers and lakes.

HERB.: *Sheldon* 165, Madison lake; *Ballard* 82, Chaska; *Taylor* 269, Janesville; *Holzinger* 102, Winona Co.; *Sandberg* 249, Center City; *Herb. Sheld.* 1732, Minneapolis.

SAMBUCUS LINN. Gen. 247 (1737).

Tripetalus LINDL. Mitch. Three Exp. II, 14 (1839).

Phyteuma LOUR. Fl. Coch. Chin. 172 (1790).

Ballon, *Hist. Pl.* VII, 501; Benth. and Hook., *Gen. Pl.* II, 3; Durand, *Ind. Gen. Phan.* 169; Schenck, *Palaeophyt.* 788.

Living species: $12\pm$; temperate regions, except Cape

of Good Hope and mts. of tropics. Russia, 3; Europe, 3; N. America, 5; Canada, 3; Rocky mts., 3; S. Sts., 2; California, 2; Pl. King, 3; Pl. Wheel., 3; W. Tex., 2.

Fossil species: Amber; Germany (*Conwentz*).

***Sambucus racemosa* LINN. Spec. 270 (1753).**

S. pubens MICHX. Fl. N. Am. I, 181 (1803).

S. pubescens PERS. Syn. I, 328 (1805).

S. pubescens var. *B.* HOOK. Fl. Bor.-Am. I, 279 (1833).

S. pubescens var. *arborescens* T. and G. Fl. II, 13 (1841).

Wats. and Coult., Gray's Man. 6 ed. 217; Mac., Fl. Can. I, 193, 538; Britt., Fl. N. J. 121; Wats., Fl. Calif. II, 278; Chap., Fl. S. St. 171; Coult., Fl. Colo. 124; Upham, Fl. Minn. 66; Led., Fl. Ross. II, 338; Nym., Fl. Eur.; Forbes and Hems., Fl. Sin. 348; Miyabe, Fl. Kur. 238; Herd., Fl. Eur. Russ. 62; Wats., King Exp. 133; Gray, Syn. Fl. I, 2, 8; Hart., Fl. Scand. I, 555.

Northern and Central Europe; Mid. Russia to Sib., China, Japan, Kamtk and Kuriles.

North America: N. S., across Can. to Vancouver and Alaska; S. to N. J. and Ga.; W. to Colo., Dak., Minn.; S. in Rockies to Arizona; S. in Sierras and Coast range to Calif. and Utah.

Minn. valley: Throughout; thickets and banks of streams.

HERB.: *Taylor* 44, Elysian; *Taylor* 427, Janesville; *Herrick* 130, St. Louis river; *Sandberg* 252, Goodhue Co.; *Herrick* 131, Minneapolis; *Holzinger* 103, Winona Co.; *Sandberg* 253, Tower; *Kassube* 113, Minneapolis; *Herb. Sheld.* 1869, Minneapolis; *Herb. Wickersheim* 58, Mankato; *Herb. Moyer* 99, Montevideo.

***Sambucus canadensis* LINN. Spec. 269 (1753).**

S. nigra MARSH. Arbust. Amer. 141 (1785).

S. humilis RAF. Ann. Nat. 13 (1820).

S. glauca GRAY, Pl. Wright. II, 66 (1852).

Wats. and Coult., Gray's Man. 6 ed. 217; Britt., Fl. N. J. 121; Webb., Fl. Neb. 143; Mac., Fl. Can. I, 194; Upham, Fl. Minn. 66; Chap., Fl. S. St. 171; Coult., Fl. Colo. 124; Wats., King Exp. 134; Cov., Fl. Ark. 187; Gray, Syn. Fl. I, 2, 9; Coult., Fl. Tex. 155.

North America: N. S. to Saskatchewan; S. to N. Eng., N. J. and Fla.; W. to Minn., Neb., Iowa, Dak., Ark., Tex., Colo., Utah, Arizona.

Minn. valley: Throughout; thickets and banks of streams.

HERB.: *Sheldon* 1166, New Ulm; *Sheldon* 1098, Springfield; *Sheldon* 336, Smith's Mills, Blue Earth Co.; *Sheldon* 729, Sleepy Eye; *Ballard* 129, Chaska; *Ballard* 551, Spring lake,

Scott Co.; *Sandberg 251*, Cannon Falls; *Herb. Sheld. 1688*, Minnetonka; *Herb. Moyer 98*, Montevideo.

VIBURNUM LINN. Gen. 245 (1737).

Opulus TOURN. Inst. 607 (1700).

Microtinus, Selenotinus, Oreinotinus, Tinus OERST. Vidd. Kjob. (1860).

Baillon, *Hist. Pl.* VII, 502; Benth. and Hook., *Gen. Pl.* II, 3; Durand, *Ind. Gen. Phan.* 169; Schenck., *Palaeophyt.* 789.

Living species: $80 \pm$; temperate and warmer N. hemisphere; Andes; Madagascar; W. Indies. North America, 14; S. Sts., 11; Canada, 8; Rocky mts., 1; E. Sts., 12; California, 1; W. Tex., 2.

Fossil species: A considerable number described; Cretaceous (Upper) and Tertiary, America and Europe; Greenland and Spitzbergen abundant (*Heer*). The bulk of the species are in W. N. America (*Saporta, Ward, Lesquereaux, Heer et alt.*) $75 \pm$ species.

Viburnum opulus LINN. Spec. 268 (1753).

V. trilobum MARSH. Arbust. Amer. 162 (1785).

V. opuloides MUHL. Cat. (1813).

V. oxycoccus PURSH, Fl. Am. 203 (1814).

V. edule HOOK. Fl. Bor.-Am. I, 281 (1833) *in part*.

V. opulus var. *americanum* T. and G. Fl. II, 18 (1841).

Wats. and Coult., Gray's Man. 6 ed. 217; Britt., Fl. N. J. 122; Mac., Fl. Can. I, 195; Upham, Fl. Minn. 66; Hook., Fl. Gt. Brit. 189; Led., Fl. Ross. II, 384; Nym., Fl. Eur.; Forbes and Hems., Fl. Sin. 354; Miyabe, Fl. Kur. 238; Herd., Fl. Eur. Russ. 62; Gray, Syn. Fl. I, 2, 10; Hart., Fl. Scand. I, 62.

Europe; Arctic Russ. to Caucasus; N. and Mid. Asia to China, Japan, Kuriles and Kamtk.

North America: Anticosti and N. S. to Red valley and Assiniboia; W. to Brit. Col. and Oregon; S. to Minn., Penn. and N. J.

Minn. valley: Forest district and N. W.; edges of woods and along streams.

HERB.: *Ballard 146*, Chaska; *Taylor 1099*, Glenwood; *Taylor 940*, Glenwood; *Taylor 549*, Janesville; *Taylor 278*, Janesville; *Sheldon 231*, Lake Washington, Blue Earth Co.; *Arthur 174*, Vermilion Lake; *Kassube 116*, Minneapolis; *Sandberg 257*, Cannon Falls; *Herb. Sheld. 1768*, Minneapolis.

Viburnum pubescens (AIT.) PURSH, Fl. Am. 202 (1814).

V. dentatum var. *pubescens* AIT. Hort. Kew. I, 372? (1789).

V. subtomentosum MICHX. Fl. N. Am. I, 179 (1803) *in part*.

V. villosum RAF. Med. Repos. V, 361 (1808).

V. rafinesquianum R. and S. Syst. V, 630 (1819).

Wats. and Coult., Gray's Man. 6 ed. 218; Britt., Fl. N. J. 122; Mac., Fl. Can. I, 194; Upham, Fl. Minn. 66; Chap., Fl. S. St. 172; Gray, Syn. Fl. I, 2, 11.

North America: Q. to Assiniboia; S. to N. Eng., N. J. and mts. of Ga.; W. to Minn. and Iowa.

Minn. valley: Throughout; rocky places and gravelly banks.

HERB.: *Bailey* 62, Vermilion lake; *Sandberg* 256, Tower; *Herb. Sheld.* 1778, Ft. Snelling; *Herb. Moyer*, 101 Montevideo.

Viburnum dentatum LINN. Spec. 268 (1753).

V. dentatum var. *lucidum* AIT. Hort. Kew. I, 372 (1789).

V. dentatum var. *glabellum* MICHX. Fl. I, 179 (1803) *in part*.

Wats. and Coult., Gray's Man., 6 ed. 218; Britt., Fl. N. J. 122; Mac., Fl. Can. I, 194, 538; Upham, Fl. Minn. 66; Chap., Fl. S. St. 172; Cov., Fl. Ark. 187; Gray, Syn. Fl. I, 2, 11.

North America: N. Br., Ont. to N. J. and Ga.; W. to Minn. and Ark.

Minn. valley: Forest district and W. to Cottonwood valley; wet woods and edges of swamps.

HERB.: *Ballard* 237, Jordan, Scott Co.; *Sandberg* 255, Red Wing; *Kassube* 115, Minneapolis; *Holzinger* 104, Hamilton.

Viburnum lentago LINN. Spec. 268 (1753).

Wats. and Coult., Gray's Man. 6 ed. 219; Britt., Fl. N. J. 121; Mac., Fl. Can. I, 194; Upham, Fl. Minn. 66; Webb., Fl. Neb. 143; Chap., Fl. S. St. 171; Cov., Fl. Ark. 187; Gray, Syn. Fl. I, 2, 12.

North America: Q. to Red and Saskatchewan valleys; S. to N. Eng., N. J. and Ga.; W. to Minn., Neb., Mo., Ark.

Minn. valley: Throughout; thickets and edges of woods.

HERB.: *Sheldon* 506, Waseca; *Sheldon* 381, Madison Lake; *Taylor* 268, Janesville; *Sheldon* 711, Sleepy Eye; *Taylor* 43, Elysian; *Ballard* 231, Jordan, Scott Co.; *Sheldon* 1295, Lake Benton; *Kassube* 114, Minneapolis; *Sandberg* 254, Red Wing; *Herrick* 132, Minneapolis; *Herb. Wickersheim* 59, Idlewild, Lincoln Co.; *Herb. Sheld.* 1777, Minneapolis; *Herb. Moyer* 100, Chippewa river, near Montevideo.

CII. ADOXACEAE. Adoxa Family.

Bentham and Hooker, *Gen. Plant.* II, 2 (1873)—*sub Sambuceae*; Baillon, *Hist. Pl.* VII, 503 (1880)—*Adoxeae*, Trib. XV of *Rubiaceae*.

Genera: 1; N. hemisphere.

Species: 1; boreal and temperate region to Arctic circle; around the pole.

ADOXA LINN. Gen. 334 (1737).*Moschetallina* TOURN. Inst. 156 (1700).*Moscatella* CORD. Adans. Fam. Pl. II, 243 (1763).Baillon, *Hist. Pl.* VII, 503; Benth. and Hook., *Gen. Pl.* II, 2; Durand, *Ind. Gen. Phan.* 169.

Living species: 1; arctic and temperate regions, N. hemisphere.

Adoxa moschatellina LINN. Spec. 257 (1753).*Moschetallina tetragona* MOENCH, Meth. 478 (1794).

Wats. and Coult., Gray's Man. 6 ed. 216; Mac., Fl. Can. I, 193; Upham, Fl. Minn. 66; Coult., Fl. Colo. 123; Hook., Fl. Gt. Brit. 190; Trautv., Fl. Sib. 63; Led., Fl. Ross. II, 382; Nym., Fl. Eur.; Forbes and Hems., Fl. Sin. 347; Herd., Fl. Eur. Russ. 62; Roth., Wheel. Exp. 8, 135; Gray, Syn. Fl. I, 2, 8; Hart., Scand. Fl. I, 156.

Northern Europe to Pyrenees and Caucasus; Siberia, Kamtk. and China.

North America: W. and C. Can., Hudson Bay reg. to Brit. Col. and to 54° and 64° N. lat.; S. to Colo., Minn., Iowa and Wisc.

Minn. valley: Reported from E. edge; but very doubtful; banks of streams.

HERB.: Sandberg 250, Vasa.

CIII. VALERIANACEAE. Valerian Family.Endlicher, *Gen. Pl.* 350 (1836-40); Bentham and Hooker, *Gen. Plant.* II, 151 (1873); Baillon, *Hist. Pl.* VII, 504 (1880).*Genera*: 8; N. hemisphere and S. America; principally N. regions.*Species*: 325±, largely developed in temperate Asia and Europe.**VALERIANA** LINN. Gen. 21 (1737) emend. Benth. l. c. (1873).Baillon, *Hist. Pl.* VII, 517; Benth. and Hook., *Gen. Pl.* II, 154; Durand, *Ind. Gen. Phan.* 187; Schenck, *Palaeophyt.* 794.

Living species: 150±, all temperate and tropical regions except Australia. Russia, 18; Europe, 21; Russian Europe, 8; North America, 8; Canada, 4-5; Rocky mts., 3; E. Sts., 3; S. Sts., 2; California, 1; Pl. King, 2; Pl. Wheel., 2.

Fossil species: 1, *Valerianites*, Oligocene, Aix (*Saporta*).**Valeriana edulis** NUTT. T. and G. Fl. II, 48 (1841).*Patrinia ceratophylla* HOOK. Fl. Bor.-Am. I, 290 (1833).*Valeriana ciliata* T. and G. Fl. II, 49 (1841).*Patrinia longifolia* MACNAB, Edin. Phil. Journ. XIX (—).

Valeriana ceratophylla MACM. MSS. (1891).

Wats. and Coult., Gray's Man. 6 ed. 228; Mac., Fl. Can. I, 205; Upham, Fl. Minn. 68; Wats., King Exp. 136; Roth., Wheel. Exp. 138; Gray, Syn. Fl. I, 2, 45.

North America: Ont. to Brit. Col. ?; S. to Ohio, Iowa, Minn., Colo., Nev., N. Mex. and Arizona.

Minn. valley: S. E. districts and perhaps throughout forest district; rich ground along streams.

HERB.: *Sheldon* 638, Wilton, Waseca Co.; *Sheldon* 536, Waseca; *Sandberg* 266, Goodhue Co.; *Holtz* 2, Cedar lake; *Holzinger* 108, Winona.

VALERIANELLA MOENCH, Meth. 493 (1794) *emend.* Benth. l. c. (1873).

Fedia GAERTN. Fruct. II, 36 (1791).

Polypremum ADANS. Fam. Pl. II, 152 (1763).

Odontocarpa NECK. Elem. I. 133 (1790).

Dufresnia DC. Mem Valer. 8 (1832).

Baillon, *Hist. Pl.* VII, 515; Benth. and Hook., *Gen. Pl.* II, 156; Durand, *Ind. Gen. Phan.* 187.

Living species: 55±; centers in the Mediterranean region; Europe; N. Africa; W. Asia; N. America. Europe, 22; Russian Europe, 9; Russia, 19; North America, 12-13; Canada, 3; E. Sts., 5-6; W. Tex., 4.

Valerianella radiata (WILLD.) DUFRESNE, Hist. Val. 57 (1811).

Valeriana radiata WILLD. Spec. I, 184 (1797).

Fedia radiata MICHX. Fl. N. Am. I, 118 (1803).

Wats. and Coult., Gray's Man. 6 ed. 229; Chap., Fl. S. St. 184; Upham, Fl. Minn. 68; Cov., Fl. Ark. 188; Gray, Syn. Fl. I, 2, 45; Coult., Fl. Tex. 164.

North America: Penn. to Minn., Ark., Tex. and Fla.

Minn. valley: Reported from E. edge; doubtful; low, rich ground.

Valerianella chenopodifolia (PURSH) DC. Prodr. IV, 629 (1830).

Fedia chenopodifolia PURSH, Fl. Am. 727 (1814).

F. radiata TORR. Fl. U. S. I, 35 (1824).

F. triquetra HOCHST. and STEUD. Flora (1837).

F. fagopyrum T. and G. Fl. II, 51 (1841).

Wats. and Coult., Gray's Man. 6 ed. 229; Upham, Fl. Minn. 68; Gray Syn. Fl. I, 2, 45.

North America: N. Y. to Minn.; S. to Va., Ind. and Ky.

Minn. valley: Reported from E. edge; rare; low and rich grounds.

CIV. CUCURBITACEAE. Gourd Family.

Endlicher, *Gen. Pl.* 934 (1836-40); Endlicher, l. c. 933 (1836-40)—*Nandirhobeae*; Bentham and Hooker, *Gen. Plant.* I, 816 (1862-67); Baillon, *Hist. Pl.* VIII, 375 (1886); Müller and Pax, in *Engler and Prantl, Nat. Pflanz.* IV, 5, 1 (1889).

Genera: 80-85; cosmopolitan; most richly developed in the tropics. Old World, 50±; New World, 36-39.

Species: 650±; mostly tendril-bearing herbs.

SICYOS LINN. Gen. 739 (1737).

Sicyoides TOURN. *Inst.* 103 (1700).

Badaroa BERT. *Herb.* 838 ex Endl. *Gen.* (1840).

Baillon, *Hist. Pl.* VIII, 428; Benth. and Hook., *Gen. Pl.* I, 837; Durand, *Ind. Gen. Phan.* 150; Engl. *Nat. Pflanz.* IV, 5, 37 (Müller and Pax).

Living species: 30; warmer America; Pacific islands; Australia. Russia, 1; Russian Europe, 1; W. Tex., 1.

Sicyos angulatus LINN. Spec. 1013 (1753).

Elaterium trifoliatum LINN. *Mant.* 123 (1767).

Sicyoides angulata MOENCH, *Meth.* 513 (1794).

Sicyos acutus RAF. *Fl. Lud.* 113 (1817).

Wats. and Coult., *Gray's Man.* 6 ed. 195; Webb., *Fl. Neb.* 141; Upham, *Fl. Minn.* 59; Mac., *Fl. Can.* I, 176, 532; Chap., *Fl. S. St.* 149; Britt., *Fl. N. J.* 111; Led., *Fl. Ross.* II, 143; Herd., *Fl. Eur. Russ.* 52; Coult., *Fl. Tex.* 125; Cov., *Fl. Ark.* 184; Engl. Müller and Pax, *Nat. Pflanz.* IV, 5, 38; Wats., *Bibl. Ind.* I, 395.

S. Russia and Caucasus mts.

North America: Q., Ont., N. H. to N. J. and Fla.; W. to Minn., Neb., E. Kan., Ark. and Tex.

Minn. valley: S. E. district; river banks and near lake shores; climbing over shrubbery.

HERB.: *Sandberg 212*, Red Wing.

MICRAMPELIS RAF. Med. Rep. V, 352 (1808).

Hexameria T. and G. *Rep. Pl. N. Y.* 137 (1836).

Megarhiza TORR. *Pac. R. R. Rep.* VI, 74 (1857).

Marah KELLOGG, *Proc. Cal. Acad.* 38 (1876).

Echinocystis T. and G. *Fl. N. Am.* I, 542 (1838).

Echinopepon NAUD. *Ann. Sci. Nat. ser.* 5, VI, 17 (1866).

Baillon, *Hist. Pl.* VIII, 433; Benth. and Hook., *Gen. Pl.* I, 835; Durand, *Ind. Gen. Phan.* 150; Engler and Prantl, *Nat. Pflanz.* IV, 5, 35; O. Kuntze, *Rev. Gen.* I, 257.

Living species: 25; tropical S. America; warmer and temperate N. America. N. America above Mexico 6± (see *Greene, Pittonia* vol. II).

Micrampelia echinata (MUHL.) RAF. Med. Rep. 352 (1808).

Momordica echinata MUHL. *Trans. Am. Phil. Soc.* III, 180 (1793).

Sicyos lobatus MICHX. *Fl. N. Am.* II, 217 (1803).

Momordica lobata SERINGE, DC. Prodr. III, 312 (1828).

Echinocystis lobata T. and G. Fl. I, 542 (1838).

E. echinata B. S. P. Cat. N. Y. (1888).

Micrampelis lobata GREENF, Pittonia 128 (1890).

Wats. and Coult., Gray's Man. 6 ed. 195; Britt., Fl. N. J. 111; Webb., Fl. Neb. 141; Upham, Fl. Minn. 59; Coult., Fl. Colo. 109; Mac., Fl. Can. I, 177, 532; Engl., Nat. Pflanz. IV, 5, 35; Wats., Bibl. Ind. I, 394.

North America: N. S., N. Br., Ont. to S. Man.; S. to N. Eng., Penn., N. J., Del.; W. to Red, Assiniboine, Saskatchewan valleys, Minn., Neb., Colo., Kan. and Tex.

Minn. valley: Throughout; less common W. of Chippewa valley; rich river banks and damp places near lakes.

HERB.: Taylor 1023, Glenwood; Sheldon 1094, Springfield; Oestlund 64, Minneapolis; Kassube 98, Minneapolis; Oestlund 65, Minneapolis; Sandberg 213, Goodhue Co.; Sandberg 214, Red Wing; Herb. Sheld. 1684, Minneapolis.

CV. CAMPANULACEAE. Blue-Bell Family.

Endlicher, Gen. Pl. 513 (1836-40); Endlicher, l. c. 509 (1836-40)—*Lobeliaceae*; DC. Prodr. VII, 497 (1838)—*Cyphiaceae*; Mart. in DC. Prodr. l. c. 548 (1838)—*Sphenocleaceae*; Bentham and Hooker, Gen. Plant. II, 541 (1876); Baillon, Hist. Pl. VIII, 317 (1886)—*excl. Goodeniaceae, Brunoniaceae, Phyllachneae*; Schönland in Engler and Prantl, Nat. Pflanz. IV, 5, 40 (1889).

Genera: 55; temperate regions; a few represented in tropical mts.; herbaceous forms widely distributed; shrubby forms principally American.

Species: 1150±; abundant in W. Europe and Mediterranean region.

CAMPANULA LINN. Gen. 129 (1737).

Roucela DUM. Comm. Bot. 14 (1822).

Erinia NOUL. Fl. S.-Pyr. 407 (1837).

Depierrea ANON. Linn. XVI, 372 (1842).

Medium TOURN. Elem. Bot. I, 90 (1694).

Marianthemum SCHR. D. R. Ges. I (—).

Quinquelocularia KOCH, Linn. XXIII, 630 (1849).

Symphandra A. DC. Mon. Camp. 365 (1830).

Adenophora FISCH. Mem. Mosc. VI, 165 (1823).

Floerkea SPRENG. Anleit. II, 523 (1802).

Heterocodon NUTT. Trans. Phil. Soc. VIII, 255 (1842).

Baillon, Hist. Pl. VIII, 353; Benth. and Hook., Gen. Pl. II, 561; Durand, Ind. Gen. Phan. 240; Engler and Prantl, Nat. Pflanz. IV, 5, 49 (Schönland.)

Living species: 250; temperate regions, N. hemisphere; especially Mediterranean region; Europe, 100; Russia, 56; Russian Europe, 15; North America, 13; Canada, 11; E.

Sts., 4; Rocky mts., 4; S. Sts., 5; California, 5; Pl. Wheel., 3; Pl. King, 5; W. Tex., 2.

Campanula americana LINN. Spec. 233 (1753).

C. declinata MOENCH, Meth. (1794).

C. obliqua JACQ. Hort. Schoenb. 336 (1798).

C. acuminata MICHX. Fl. N. Am. I. 108 (1803).

C. illinoensis FRES. fide Gray.

Wats. and Coult., Gray's Man. 6 ed. 309; Britt., Fl. N. J. 157; Webb., Fl. Neb. 141; Mac., Fl. Can. I, 289; Upham, Fl. Minn. 92; Chap., Fl. S. St. 256; Cov., Fl. Ark. 199; Gray, Syn. Fl. II, 1, 14; Engl. Schön., Nat. Pflanz. IV, 5, 51.

North America: N. Br. and Ont. to Minn.; S. to N. J. and Fla.; W. to Dak., Neb., Kan., Ark.

Minn. valley: Throughout; rich woods or thickets and shady banks.

HERB.: *Sheldon* 1096, Springfield; *Sheldon* 788, Cottonwood river, near Sleepy Eye; *Sheldon* 1163, New Ulm; *Ballard* 614, Chaska; *Oestlund* 109, Minneapolis; *Sandberg* 370, Cannon Falls; *Herb. Moyer* 158, Montevideo.

Campanula aparinoides PURSH, Fl. Am. 159 (1814).

C. erinoides MUHL. Cat. (1813) *not* Linn.

Wats. and Coult., Gray's Man. 6 ed. 309; Britt., Fl. N. J. 157; Webb., Fl. Neb. 141; Chap., Fl. S. Sts. 256; Coult., Fl. Colo. 226; Mac., Fl. Can. I, 288; Gray, Syn. Fl. II, 1, 13.

North America: N. Br., Q., Ont. to S. Man. and Saskatchewan; S. to N. Eng., N. J. and mts. of Ga; W. to Minn., Colo. and Neb.

Minn. valley: Throughout; cold bogs, marshes or grassy shores of streams and lakes.

HERB.: *Sheldon* 748, Sleepy Eye; *Sheldon* 693, Waseca; *Taylor* 525, Mud lake, Waseca Co.; *Ballard* 437, Prior's lake, Scott Co.; *Ballard* 585, Rice lake, Scott Co.; *Taylor* 824, Glenwood; *Ballard* 666, Waconia; *Ballard* 773, Swan lake, Carver Co.; *Ballard* 828, Page lake, Carver Co.; *Ballard* 718, Benton, Carver Co.; *Bailey* 272, St. Louis river; *Winchell* 12, Minnetonka; *Bailey* 321, St. Louis river; *Roberts* 75, Grand Marais; *Kassube* 154, Minneapolis; *Holzinger* 138, Winona Co.; *Bailey* 110, Vermilion lake; *Sandberg* 369, Red Wing; *Holzinger* 139, Winona; *Herb. Sheld* 1687, Minneapolis.

Campanula rotundifolia LINN. Fl. Dan. 855 (1857).

C. petiolata A. DC. Camp. 279, 338 (1830).

Wats. and Coult., Gray's Man. 6 ed. 308; Britt., Fl. N. J. 157; Webb., Fl. Neb. 141; Mac., Fl. Can. I, 288, 560; Upham, Fl. Minn. 92; Coult., Fl. Colo. 226; Brew. and Wats., Fl. Calif. I, 447; Led., Fl. Ross. II, 888;

Nym., Fl. Eur.; Hook., Fl. Gt. Brit. 246; Miyabe, Fl. Kur. 245; Herd., Fl. Eur. Russ. 82; Wats., King Exp. 208; Roth., Wheel. Exp. 183; Engl. Schönland, Nat. Pflanz. IV, 5, 50; Gray, Syn. Fl. II, 1, 12 and Suppl. II, 395; Hart., Fl. Scand. I, 72; Coult., Fl. Tex. 252.

Circumpolar and all Eur. except Lusitania, Corsica, Greece and Spanish Coast; Asia to Himalayas; Kuriles and Saghalin to Japan.

North America: Greenland at lat. 64° N. to Alaska; S. in Rockies to Mexico; E. to Minn., Neb., Ohio? and N. J.

Minn. valley: Forest district and N. W.; probably throughout; rocky banks and gravelly places.

HERB.: *Ballard* 95, Shakopee; *Taylor* 861, Glenwood; *Leonard* 30, Chatfield; *Bailey* 475, Agate Bay; *Kassube* 153, Minneapolis; *Roberts* 74, Grand Marais; *Sandberg* 368, Red Wing; *Hammond* 24, Lake City; *Herb. Sheld.* 1888, Minneapolis.

PENTAGONIA SIEG. Suppl. 14 (1737).

Speculum HALL. Fl. Jen. 215 (1745).

Specularia HEIST. Syst. Pl. VIII (1748).

Legouzia DUR. Fl. Bourg. II, 26 (1782).

Apenula NECK. Elem. I, 234 (1790).

Prismatocarpus L'HER. Sert. Angl. 1 (1788) p. p.

Triodanis RAF. ex Schönl. l. c. (1889).

Dysmicodon and *Campylocera* NUTT. Trans. Phil. Soc. 2, VIII, 255-257 (1842).

Baillon, *Hist. Pl.* VIII, 320 (sub *Campanula*); Benth. and Hook., *Gen. Pl.* II, 562; Durand, *Ind. Gen. Phan.* 240; O. Kuntze, *Rev. Gen.* II, 381; Engler and Prantl, *Nat. Pflanz.* IV, 5, 52 (Schönland).

Living species: 10; Middle Europe, 2; Mediterranean region, 6; North America, 4; Canada, 1; E. Sts., 2; California, 2; S. Sts., 2; W. Tex., 4.

Pentagonia perfoliata (LINN.) OK. Rev. Gen. II, 381 (1891).

Campanula perfoliata LINN. Spec. 239 (1753).

C. amplexicaulis MICHX. Fl. N. Am. I, (1803).

Specularia perfoliata DC. Mon. Camp. (1830).

Dysmicodon californicum and *ovatum* NUTT. Trans. Am. Phil. Soc. 2, VIII, 258 (1842).

Wats. and Coult., Gray's Man. 6 ed. 308; Britt., Fl. N. J. 157; Webb., Fl. Neb. 141; Upham, Fl. Minn. 92; Mac., Fl. Can. I, 286, 559; Chap., Fl. S. St. 257; Coult., Fl. Colo. 225; Brew. and Wats., Fl. Calif. I, 447; Roth., Wheel. Exp. 183; Wats., King Exp. 209; Cov., Fl. Ark. 199; Engl. Schönl. Nat. Pflanz. IV, 5, 52; Gray, Syn. Fl. II, 1, 11; O. Kuntze, Rev. Gen. II, 381; Coult., Fl. Tex. 252.

South America: Chile.

North America: Ont. to Brit. Col. and Pac.; S. to Oregon, Calif., Mexico; E. to Atl. coast, Fla. and Tex.

Minn. valley: N. E. district; open, sterile places and dry banks.

HERB.: *Kassube* 155, Minneapolis.

LOBELIA LINN. Gen. 678 (1737).

Dortmanna, Stooria, Ymnostema, Juchia NECK. Elem. I, 132 (1790).

Rapuntium GAERTN. Fruct. I, 151 (1788).

Trimeris, Tylomium, Dobrowskia, Mezleria, Gramatotherca PRESL, Mon. Lob. Prodr. 7-46 (1836).

Tupa G. DON, Syst. III, 700 (1834).

Holostigma and Parastranthus G. DON, l. c. 716 (1834).

Rhyncopetalum FRESEN. Mus. Senk. III, 66 (1845).

Diastatea SCHEIDW. Allg. Zeit 396 (1841).

Monopsis SALISB. Trans. Hort. Soc. Lond. (1812?).

Isolobus A. DC. Prodr. VII, 352 (1838-39).

Sclerotheca A. DC. l. c. 356 (1838-39).

Dialypetalum BENTH. Gen. Pl. II, 553 (1876).

Palmerella A. GRAY, Proc. Am. Acad. XI, 80 (1876).

Haynaldia KAN. Mag. Nov. Lapok. I, 3 (1877).

Baillon, *Hist. Pl.* VIII, 362; Benth. and Hook., *Gen. Pl.* II, 551, 553; Durand, *Ind. Gen. Phan.* 238, 239; Engler and Prantl, *Nat. Pflanz.* IV, 5, 66, 68 (Schönland).

Living species: 220; temperate and warmer regions, especially Middle and Eastern Europe and Asia; N. America, 25; Canada, 6; Rocky mts., 2; S. Sts., 17; E. Sts., 13; California, 2-3; Pl. Wheel., 3; W. Tex., 8.

Lobelia inflata LINN. Spec. 931 (1753).

Wats. and Coult., Gray's Man. 6 ed. 307; Britt., Fl. N. J. 156; Upham, Fl. Minn. 91; Mac., Fl. Can. I, 286; Chap., Fl. S. St. 254; Cov., Fl. Ark. 199; Engl. Schönland, Nat. Pflanz. IV, 5, 67; Gray, Syn. Fl. II, 1, 7.

North America: Maritime provinces of Can. to Hudson Bay and Saskatchewan; S. to N. J., N. Car. and Ga.; W. to Minn., Mo. and Ark.

Minn. valley: Forest district; especially S.; rare; open places or meadows.

Lobelia kalmii LINN. Spec. 929 (1753).

Wats. and Coult., Gray's Man. 6 ed. 307; Britt., Fl. N. J. 157; Upham, Fl. Minn. 92; Mac., Fl. Can. I, 286, 559; Gray, Syn. Fl. II, 1, 7.

North America: Anticosti, N. S., N. Br. to Brit. Col., Hudson Bay, lat. 60° N. and Saskatchewan; S. to N. J. and Penn.; W. to Minn. and Mo.

Minn. valley: Forest district; S. to Blue Earth Co.; peat bogs and mossy places.

HERB.: *Ballard* 618, Shakopee; *Taylor* 753, Glenwood; *Bailey* 479, Agate bay; *Sandberg* 366, Red Wing; *Roberts* 72,

Grand Marais; *Roberts* 73, Agate bay; *Kassube* 152, Minneapolis; *Leiberg* 45, Blue Earth Co.; *Oestlund* 108, Hennepin Co.; *Sandberg* 367, Goodhue Co.

***Lobelia spicata* LAM.** Enc. Meth. III, 587 (1786).

L. claytoniana MICHX. Fl. N. Am. II, 153 (1803).

L. pallida MUHL. Cat. (1813).

L. goodenioides WILLD. Hort. Berol. 30 (1816).

L. nivea RAF. Ann. Nat. 15 (1820).

Wats. and Coult., Gray's Man. 306; Britt., Fl. N. J. 156; Webb., Fl. Neb. 141; Upham, Fl. Minn. 92; Mac., Fl. Can. I, 286; Chap., Fl. S. St. 255; Cov., Fl. Ark. 199; Gray, Syn. Fl. II, 1, 6.

North America: Ont. to L. Huron reg.; S. to N. J. and Miss.; W. to Minn., Neb., Ark. and La.

Minn. valley: Throughout; abundant; moist or dry fields or sandy banks of lakes or streams.

HERB.: *Sheldon* 1475, Pipestone; *Sheldon* 1115, Springfield; *Taylor* 550, Janesville; *Taylor* 563, Minnesota lake; *Taylor* 860, Glenwood; *Sheldon* 769, Sleepy Eye; *Taylor* 766, Glenwood; *Sheldon* 633, Wilton, Waseca Co.; *Ballard* 461, Prior's lake, Scott Co.; *Oestlund* 107, Hennepin Co.; *Leiberg* 44, Blue Earth Co.; *Herrick* 183, Minneapolis; *Leonard* 29, Minneapolis; *Holzinger* 137, Winona Co.; *Sandberg* 364, Chisago Co.; *Kassube* 151, Minneapolis; *Sandberg* 365, Cannon Falls; *Herb. Sheld.* 1924, Minneapolis; *Herb. Wickersheim* 89, Idlewild, Lincoln Co.; *Herb. Moyer* 157, Montevideo. The last three are var. *hirtella* Gray.

***Lobelia syphilitica* LINN.** Spec. 945 (1753).

L. glandulosa LINDL. Bot. Reg. XXXII, t. 63 (1847).

L. syphilitica var. *ludoviciana* A. DC. Prodr. VII, 377 (1837).

Wats. and Coult., Gray's Man. 6 ed. 306; Britt., Fl. N. J. 156; Webb., Fl. Neb. 141; Mac., Fl. Can. I, 285; Chap., Fl. S. St. 254; Upham, Fl. Minn. 91; Coult., Fl. Colo. 224; Cov., Fl. Ark. 199; Engl. Schönland, Nat. Pflanz. IV, 5, 67; Gray, Syn. Fl. II, 1, 4.

North America: Ont. to Owen Sound, Minn. and Dak.; S. to N. J., Ga. and La.; W. to Colo., Neb. and Ark.

Minn. valley: Throughout; low meadows and thickets; frequent.

HERB.: *Sheldon* 1400, Lake Benton; *Sheldon* 1322, Verdi, Lincoln Co.; *Taylor* 1051, Glenwood; *Kassube* 150, Minneapolis; *Huntington* 10, Rock Co.; *Holzinger* 136, Winona Co.; *Oestlund* 106, Minneapolis; *Sandberg* 362, Goodhue Co.; *Sandberg* 363, Cannon Falls; *Herb. Sheld.* 1662, Minneapolis.

***Lobelia cardinalis* LINN.** Spec. 930 (1753).

Wats. and Coult., Gray's Man. 6 ed. 305; Britt., Fl. N. J. 156; Upham, Fl. Minn. 91; Mac., Fl. Can. I, 285; Chap., Fl. S. St. 254; Coult., Fl. Colo.

224; Cov., Fl. Ark. 199; Engl. Schönland, Nat. Pflanz. IV, 5, 67; Gray, Syn. Fl. II, 1, 3; Coult., Fl. Tex. 251.

North America: N. S., N. Br. to Owen Sound, Wisc. and Minn.; S. to Colo., Ark., Miss., Fla. and Tex.; E. to Ills. and N. J.; N. to Saskatchewan.

Minn. valley: N. E. district; near Ft. Snelling; rare and local; deep woods or edges of bogs.

HERB.: *Holzinger* 135, Winona Co.; *Sandberg* 361, Goodhue Co.

CVI. COMPOSITAE. Composite Family.

Endlicher, *Gen. Pl.* 355 (1836-40); Rich.-ex Endl. (1801)—*Synanthereae*; Lindl., *Veg. King.* 702 (1846)—*Asteraceae*; Schultz-Bipontius, *Flora* 129 (1852)—*Cassiniaceae*; Bentham and Hooker, *Gen. Plant.* II, 163 (1873); Baillon, *Hist. Pl.* VIII, 1 (1886); Hoffmann in *Engler and Prantl, Nat. Pflanz.* IV, 5, 87 (1889).

Genera: 500±; 400± (Baillon); 766 (B. and H.); cosmopolitan. 6, fossil from Miocene (*Schimper*), doubtful.

Species: 10,000-12,000; arborescent forms tropical; 30±, fossil, doubtful.

VERNONIA SCHREB. *Gen. Pl.* II, 541 (1774).

Baccharoides MOENCH, *Meth.* 578 (1794).

Teichostemma R. BR. *Salt. Abyss. App.* 65 (1828).

Candidia TEN. *Att. Ac. Nap.* IV, 104 (1822).

Hololepis DC. *Act. Mus. Par.* XVI, 189 (1818).

Leiboldia SCHLECHT. ex Walp. *Ann.* I, 388 (1848).

Ascaricida, **Gymnanthemum**, **Isonema**, **Distephanus** CASS. *Bull. Philom.* (1817).

Lepidoploa, **Achyrocoma**, **Centrapalus**, **Oliganthes** CASS. *Dict.* III, VII, XXVI (1826).

Acilepis DON, *Nep.* 139 (1803).

Sufrago GAERTN. *Fruct.* II, 402 (1791) *part.*

Stengelia, **Linzia**, **Cheliusia** SCH.-BIP. *Flora* (1841).

Lysistemma, **Ambassa**, **Xipholepis**, **Crystallopollen**, **Punduana** STEETZ. *Pet. Moss. Bot.* 345 (1864).

Brachyleima R. BR. *Salt. Abyss. Appx.* 65 (1828).

Cyanopsis, **Webbia**, **Monosis** (*part.*), **Chronopappus**, **Centauroopsis**, **Stilpnopappus**, **Strophopappus** DC. *Prodr.* V, 62 seq. (1836).

Odontoloma, **Dialesta**, **Pollalesta** HBK. *N. Gen. et Spec.* IV, 43, 45, 46 (1820).

Polydora FENZL. *Flora* 312 (1844).

Vernonella SOND. *Linn.* XXIII, 62 (1849).

Strobocalyx, **Critoniopsis**, **Tephrothamnus**, **Stenocephalum**, **Piptolepis**, **Vanillosma**, **Iodopappus**, **Proteopsis** (MART.) SCH.-BIP. *Pollichia* (1861 and 1863).

Cyanthillium BL. *Bij.* 889 (1826).

Claotrachelus ZOLL. Geneesk. Arch. (1847).

Llerasia TRIANA, Ann. Sci. Nat. ser. 4, IX, 37 (1858).

Turpinia LLAV. and LEX. Nov. Veg. I, 24 (1824).

Adenocyclus LESS. Linn. IV, 337 (1830).

Xiphochaeta POEPP. et ENDL. N. Gen. III, 44 (1845).

Lachnorhiza A. RICH. Cub. Fl. II, 34 (1853).

Carpophyllus SCHOTT. Spreng. Syst. Cur. Post. 409 (1828).

Baillon, *Hist. Pl.* VIII, 118; Benth. and Hook., *Gen. Pl.* II, 227; Durand, *Ind. Gen. Phan.* 189; Schenck, *Palaeophyt.* 794 (*Compositae*); Engler and Prantl, *Nat. Pflanz.* IV, 5, 124 (Hoffmann).

Living species: 500±; America, 250; Africa, 100; Madagascar, 50; Asia, 50; cosmopolitan, except Europe. Centers in Brazil. 10–12, U. S. Canada, 2; Rocky mts., 2; E. Sts., 6; W. Tex., 6; more numerous in Mexico and on the border.

Fossil species: A few seeds from the Miocene may be referred here with some hesitation.

Vernonia fasciculata MICHX. Fl. N. Am. II, 94 (1803).

V. corymbosa SCHWEIN. Keat. Narr. Miss. (1825).

V. altissima DC. Prodr. V, 15 (1836).

Wats. and Coult., Gray's Man. 6 ed. 238; Webb., Fl. Neb. 150; Upham, Fl. Minn. 68; Coult., Fl. Colo. 141; Cov., Fl. Ark. 189; Gray, Syn. Fl. I, 2, 90; Coult., Fl. Tex. 175.

North America: Minn., Dak., Colo. to Ohio, Ky., Neb., Ark. and Tex.

Minn. valley: Throughout; common; meadows, prairies and river banks, wet places.

HERD.: *Sheldon 1351*, Verdi, Lincoln Co.; *Sheldon 1455*, Pipestone Co.; *Taylor 680*, Minnesota lake; *Sheldon 1015*, Sleepy Eye; *Sandberg 266*, Goodhue Co.; *Oestlund 83*, Minneapolis; *Herrick 136*, Minneapolis; *Herrick 137*, Hennepin Co.; *Herb. Moyer 106*, Montevideo.

Vernonia noveboracensis (LINN.) WILLD. Spec. III, 1632 (1803).

Serratula noveboracensis LINN. Spec. 818 (1753).

S. praealta LINN. Spec. 818 (1753).

Chrysocoma tomentosa WALT. Fl. Car. 196 (1788).

Vernonia tomentosa ELL. Sk. II, 288 (1824).

V. praealta HOOK. Fl. Bor.-Am. I, 304 (1833).

Wats. and Coult., Gray's Man. 6 ed. 238; Britt., Fl. N. J. 128; Mac., Fl. Can. I, 206; Chap., Fl. S. St. 188; Upham, Fl. Minn. 68; Cov., Fl. Ark. 189; Gray, Syn. Fl. I, 2, 89; Webb., Appx. Neb. 44.

North America: Ont. to Maine and N. J.; S. to Fla. and Miss.; W. to Minn., Neb., E. Kan., Ark. and Tex.

Minn. valley: Reported from forest district; Ft. Snelling to Blue Earth Co.; rare; low grounds and near sloughs.

EUPATORIUM LINN. Gen. 638 (1737).*Osmia* and *Heterolaena* SCH. BIP. Herb. Berol.*Kerstenia* NECK. Elem. I, 81 (1790).*Chromolaena* DC. Prodr. V, 133 (1836).*Praxelis*, *Gyptis* and *Coleosanthus* CASS. Dict. X, XX, XLIII (1826-1834).*Ooclinium*, *Campuloclinium*, *Hebeclinium*, *Conoclinium*, *Critonia*, DC. Prodr. V, 133, seq. (1836).*Bulbostyles* WALP. Rep. VI, 707 (1847).*Wikstroemia* SPRENG. Syst. III, 434 (1826).*Batschia* MOENCH, Meth. 567 (1794).*Ageratiopsis* SCH. BIP. Herb. Berol.*Disynaphia* DC. Prodr. VII, 267 (1838).Baillon, *Hist. Pl.* VIII, 128; Benth. and Hook., *Gen. Pl.* II, 245; Durand, *Ind. Gen. Phan.* 192; Engler and Prantl, *Nat. Pflanz.* IV, 5, 138.Living species: 600±; 400 (*Hoffman*); 560 (*Durand*); wanting in most of Africa and in Australia; otherwise cosmopolitan; centers in Central and tropical America; United States, 50±; S. Sts., 28; Canada, 3-4; E. Sts., 18; California, 2; Rocky mts., 4; W. Tex., 19; Europe, 2-3; Russia, 3-4.**Eupatorium ageratoides LINN. f.** Suppl. 355 (1781).*Ageratum altissimum* LINN. Spec. 839 (1753).*Eupatorium altissimum* LINN. Syst. Veg. 614 (1774).*E. odoratum* WALT. Fl. Car. 200 (1788).*E. fraseri* POIR. Suppl. II, 600 (1811).

Wats. and Coult., Gray's Man. 6 ed. 241; Britt., Fl. N. J. 130; Mac., Fl. Can. I, 206; Webb., Fl. Neb. 150; Upham, Fl. Minn. 70; Chap., Fl. S. St. 196; Cov., Fl. Ark. 189; Gray, Syn. Fl. 101; Coult., Fl. Tex. 179.

North America: N. Br., Q., Ont. to N. J., Fla. and Miss.; W. to Minn., Neb., Kan., Ark., Tex.

Minn. valley: Throughout; common; woods and shaded banks; alluvial terraces and near lake shores.

HERB.: *Ballard* 806, Goose lake, Carver Co.; *Sheldon* 906, Sleepy Eye; *Sheldon* 1277, Lake Benton; *Sheldon* 1209, New Ulm; *Taylor* 979, Glenwood; *Oestlund* 88, Minneapolis; *Holzing* 109, Winona Co.; *Sandberg* 279, Vasa; *Kassube* 124, Minneapolis; *Herb. Wickersheim* 61, Lake Benton; *Herb. Moyer* 111, Chippewa river, near Montevideo.**Eupatorium perfoliatum LINN.** Spec. 838 (1753).

Wats. and Coult., Gray's Man. 6 ed. 241; Britt., Fl. N. J. 130; Mac., Fl. Can. I, 206; Webb., Fl. Neb. 150; Chap., Fl. S. Sts. 196; Coult., Fl. Colo. 142; Upham, Fl. Minn. 70; Cov., Fl. Ark. 189; Gray, Syn. Fl. I, 2, 99.

North America: N. S., N. Br. to S. Man.; S. to N. Eng., N. J., N. Car. and Fla.; W. to Minn., Neb., Dak. and La. to Ark.

Minn. valley: Throughout; common; low grounds and edges of thickets.

HERB.: *Taylor* 983, Glenwood; *Sheldon* 293, Madison lake; *Taylor* 650, Minnesota lake; *Sheldon* 1296, Lake Benton; *Ballard* 725, Benton, Carver Co.; *Herrick* 142, Minneapolis; *Kassube* 123, Ramsey Co.; *Sandberg* 278, Red Wing; *Herb. Sheld.* 1666, Minneapolis.

***Eupatorium altissimum* LINN. Spec. 1171 (1753).**

Kuhnia glutinosa DC. Prodr. V, 127 (1836).

Wats. and Coult., Gray's Man. 6 ed. 240; Webb., Fl. Neb. 150; Upham, Fl. Minn. 70; Chap., Fl. S. St. 195; Cov., Fl. Ark. 189; Gray, Syn. Fl. I, 2, 99.

North America: Penn. to Minn., Neb., Ark., Ky., Tex., N. Car.

Minn. valley: Forest district; principally S. central portion; dry soil and hillsides; infrequent.

HERB.: *Leiberg* 31, Blue Earth Co.; *Sandberg* 277, Cannon Falls.

***Eupatorium serotinum* MICHX. Fl. N. Am. II, 100 (1803).**

Wats. and Coult., Gray's Man. 6 ed. 239; Chap., Fl. S. St. 196; Upham, Fl. Minn. 70; Cov., Fl. Ark. 189; Gray, Syn. Fl. I, 2, 97.

North America: Md. to Fla. and Miss.; W. to Minn., Kan., Ark., Tex. and Mexico.

Minn. valley: Reported from S. edge; infrequent; along banks of rivers and on terraces.

***Eupatorium purpureum* LINN. Spec. 836 (1753).**

E. trifoliatum LINN. Spec. 836 (1753).

E. maculatum LINN. Amoen. Ac. IV. 288 (1759).

? *E. fusco-rubrum* WALT. Fl. Car. 199 (1788).

E. verticillatum MUHL. Willd. Spec. III, 760 (1800).

E. falcatum MICHX. Fl. N. Am. II, 99 (1803).

E. punctatum WILLD. Enum. II, 853 (1809).

E. dubium POIR. Suppl. II, 606 (1811).

E. laevigatum TORR. Cat. Pl. N. Y. (1819).

E. ternifolium ELL. Sk. II, 306 (1824).

E. purpureum var. *maculatum* DARL. Fl. Cestr. 453 (1826).

Wats. and Coult., Gray's Man. 6 ed. 239; Britt., Fl. N. J. 128; Mac., Fl. Can. I, 206, 541; Coult., Fl. Colo. 142; Webb., Fl. Neb. 150; Upham, Fl. Minn. 70; Chap., Fl. S. St. 194; Roth., Wheel Exp. 139; Cov., Fl. Ark. 189; Gray, Syn. Fl. I, 2, 95, 96; Coult., Fl. Tex. 177.

North America: Anticosti, N. S., N. Br., to Brit. Col. and Rocky mts.; to lat. 57° N.; S. to N. Eng., N. J., Fla. and Miss.; W. to Dak., Neb., Ark., N. Mex., Utah and Tex.

Minn. valley: Throughout; common; low grounds and margins of bogs.

HERB.: *Ballard* 841, Page lake, Carver Co.; *Sheldon*

1294, Lake Benton; *Taylor* 818, Glenwood; *Sheldon* 1159, New Ulm; *Sandberg* 275, Cannon Falls; *Herrick* 140, Minnetonka; *Oestlund* 87, Minneapolis; *Herrick* 141, Minneapolis; *Arthur* 64, Vermilion lake; *Kassube* 122, Minneapolis; *Sandberg* 276, Goodhue Co.; *Herb. Sheld.* 1817, Minneapolis.

KUHNIA LINN. Gen. ed. VI, 237 (1764).

Carphephorus CASS. Bull. Philom. 198 (1816).

Anonymos WALT. Fl. Car. (1788).

Baillon, *Hist. Pl.* VIII, 134; Benth. and Hook., *Gen. Pl.* II, 248; Durand, *Ind. Gen. Phan.* 192; Engl. and Prantl, *Nat. Pflanz.* IV, 5, 142 (Hoffmann).

Living species: 3; N. U. S., 1; Arizona and Mexico, 1; Mexico, 1; W. Tex., 2.

Kuhnia eupatorioides LINN. f. Dec. II, 21 (1781).

Critonia kuhnia GAERT. Fruct. II, 411 (1791).

Kuhnia critonia WILLD. Spec. III, 1773 (1803).

K. elliptica and *pubescens* RAF. N. Fl. (1836).

Wats. and Coult., Gray's Man. 6 ed. 241; Britt., Fl. N. J. 130; Webb., Fl. Neb. 149; Coult., Fl. Colo. 143; Chap., Fl. S. St. 193; Upham, Fl. Minn. 69; Cov., Fl. Ark. 189; Engl. Hoffmann, Nat. Pflanz. IV, 5, 142; Gray, Syn. Fl. I, 2, 103; Coult., Fl. Tex. 180.

North America: N. J. to Minn. and Mont.; S. to Colo., Neb., Ark. and Tex.

Minn. valley: Throughout; particularly in prairie district; dry or high prairies and fields.

HERB.: *Sheldon* 924, Sleepy Eye; *Sheldon* 923, banks of Cottonwood, near Sleepy Eye; *Sheldon* 1340, Lake Benton; *Sheldon* 1371, Verdi, Lincoln Co.; *Sheldon* 1179, New Ulm; *Leiberg* 30, Blue Earth Co.; *Oestlund* 86, Minneapolis; *Sandberg* 273, Goodhue Co.; *Herb. Moyer* 110, Montevideo.

Kuhnia eupatorioides LINN. f. var. **glutinosa** (ELL.) HITCH. Pl. Ames, 498 (1891).

K. glutinosa ELL. Sk. II, 292 (1824).

K. suaveolens FRES. Ind. Sem. Frank. (1838).

K. eupatorioides var. *corymbulosa* T. and G. Fl. II, 78 (1841).

Wats. and Coult., Gray's Man. 6 ed. 241; Coult., Fl. Colo. 143; Upham, Fl. Minn. 69; Webb., Fl. Neb. 149; Gray, Syn. Fl. I, 2, 103; Coult., Fl. Tex. 180.

North America: Dak., Minn., Ill., to Neb., Alab. and Tex.

Minn. valley: S. E. and probably W.; dry prairies and high bluffs.

HERB.: *Sandberg* 274, Red Wing.

LACINIARIA HILL. Syst. Veg. IV, 49 (1762).**Psilosanthus** NECK. Elem. (1790).**Liatris** SCHREB. Gen. Pl. 572 (1791).**Calostelma** DON, Sweet. Brit. Fl. Gard. 2, 184 (1838).

Baillon, *Hist. Pl.* VIII, 135, footnote; Benth. and Hook., *Gen. Pl.* II, 248; Durand, *Ind. Gen. Phan.* 192; O. Kuntze, *Rev. Gen.* I, 349; Engler and Prantl, *Nat. Pflanz.* IV, 5, 142 (Hoffmann).

Living species: 15; N. America and Mexico. W. Tex., 6; E. Sts., 8; R. mts., 3; S. Sts., 15; Canada, 3.

Laciniaria spicata (LINN.) OK. Rev. Gen. I, 349 (1891).*Serratula spicata* LINN. Spec. II, 819 (1753).*S. compta* DRYAND. Bibl. Banks.*Liatris macrostachya* MICHX. Fl. N. Am. II, 91 (1803).*L. spicata* WILLD. Spec. III, 1635 (1803).*L. resinosa* NUTT. Gen. II, 131 (1818).*L. sessiliflora* BERTOL. Misc. V, 10 (1846).

Wats. and Coult., Gray's Man. 6 ed. 243; Britt., Fl. N. J. 131; Upham, Fl. Minn. 69; Chap., Fl. S. St. 192; Mac., Fl. Can. I, 542; Cov., Fl. Ark. 190; Gray, Syn. Fl. I, 2, 111.

North America: Ont. to N. Y., Mass. and N. J.; S. to Fla. and Miss.; W. to Minn. and Ark.

Minn. valley: Throughout; moist and low prairies or meadows; abundant.

HERB.: *Sheldon* 1353, Verdi, Lincoln Co.; *Sheldon* 1535, Lake Benton; *Sheldon* 765, Sleepy Eye; *Sandberg* 270, Cannon Falls; *Leiberg* 28, Blue Earth Co.; *Sandberg* 271, Red Wing; *Kassube* 121, Minneapolis.

Laciniaria pycnostachya (MICHX.) OK. Rev. Gen. I, 349 (1891).*Liatris pycnostachya* MICHX. Fl. N. Am. II, 91 (1803).*L. brachystachya* NUTT. Jour. Acad. Phil. VII, 507 (1837).

Wats. and Coult., Gray's Man. 6 ed. 242; Webb., Fl. Neb. 149; Upham, Fl. Minn. 69; Cov., Fl. Ark. 190; Gray, Syn. Fl. I, 2, 110; Coult., Fl. Tex. 182.

North America: Ind. to Minn. and Neb., S. to Ark., Tex. and Miss.

Minn. valley: Throughout; abundant; rather low or moist prairies, but drier localities than *L. spicata* (Linn.).

HERB.: *Sheldon* 647, Waseca; *Taylor* 569, Minnesota lake; *Sheldon* 1118, Springfield; *Taylor* 1032, Glenwood; *Oestlund* 85, Minneapolis; *Herb. Moyer* 108, Montevideo.

Laciniaria scariosa (LINN.) HILL. Syst. Veg. IV, 49 (1762).*Serratula scariosa* LINN. Spec. 818 (1753).*Liatris aspera* and *sphaeroidea* MICHX. Fl. N. Am. II, 92 (1803).*L. scariosa* WILLD. Spec. III, 1635 (1803).*L. borealis* NUTT. Paxt. Mag. V, 27 (1838).

Wats. and Coult., Gray's Man. 6 ed. 242; Britt., Fl. N. J. 131; Webb.,

Fl. Neb. 149; Mac., Fl. Can. I, 208; Chap., Fl. S. St. 192; Coult., Fl. Colo. 144; Roth., Wheel. Exp. 140; Cov., Fl. Ark. 190; Engl. Hoffmann, Nat. Pflanz. IV, 5, 142; Gray, Syn. Fl. I, 2, 110; Coult., Fl. Tex. 182.

North America: Saskatchewan to Rocky mts.; N. Eng. to Minn., Neb., Tex., Fla. and Miss.

Minn. valley: Throughout; common; dry or high places, prairie districts in particular.

HERB.: *Sheldon* 1536, Lake Benton; *Sheldon* 978, Sleepy Eye; *Sheldon* 1191, Springfield; *Sheldon* 1270, Lake Benton; *Sheldon* 1364, Verdi, Lincoln Co.; *Sheldon* 1278, Lake Benton; *Sheldon* 1344, Verdi, Lincoln Co.; *Taylor* 1037, Glenwood; *Taylor* 1070, Alexandria; *Sheldon* 1586, Lake Benton; *Herrick* 138, Minneapolis; *Leiberg* 26, Blue Earth Co.; *Leiberg* 27, Blue Earth Co.—(*proliferated form*); *Herrick* 139, Minneapolis; *Oestlund* 84, Minneapolis; *Sandberg* 268, Goodhue Co.; *Kassube* 120, Minneapolis; *Sandberg* 269, Red Wing; *MacM.* and *Sheld.* 36, Brainerd; *Herb. Wickersheim* 60, Idlewild, Lincoln Co.; *Herb. Sheld.* 1813, Ramsey Co.; *Herb. Moyer* 107, Montevideo.

Laciniaria punctata (HOOK.) OK. Rev. Gen. I, 349 (1891).

Liatris punctata HOOK. Fl. Bor.-Am. I, 306 (1833).

L. cylindrica TORR. Ann. Lyc. N. Y. II, 210 (1835).

L. resinosa DC. Prodr. V, 129 (1836).

Wats. and Coult., Gray's Man. 6 ed. 242; Mac., Fl. Can. I, 208; Coult., Fl. Colo. 144; Webb., Fl. Neb. 149; Upham, Fl. Minn. 69; Cov., Fl. Ark. 190; Gray, Syn. Fl. I, 2, 110; Coult., Fl. Tex. 182.

North America: Man. and Saskatchewan to Rocky mts.; S. to Mont., Minn., Neb., Kan., N. Mex. and Tex.

Minn. valley: Throughout; principally in prairie district at higher level; dry soil with *L. scariosa* (Linn.).

HERB.: *Sheldon* 1373½, Lake Benton; *Sheldon* 1373, Lake Benton—(*white-flowered form*); *Sheldon* 1264, Lake Benton; *Sheldon* 1326, Lake Benton; *Leiberg* 29, Blue Earth Co.; *Sandberg* 272, Red Wing, *Herb. Sheld.* 1657, Minneapolis; *Herb. Moyer* 109, Chippewa river bottoms, near Montevideo.

Laciniaria cylindracea (MICHX.) OK. Rev. Gen. I, 349 (1891).

Liatris cylindracea MICHX. Fl. N. Am. II, 93 (1803).

L. graminifolia WILLD. Spec. III, 1636 (1803).

L. squarrosa HOOK. Fl. Bor.-Am. I, 306 (1833).

Wats. and Coult., Gray's Man. 6 ed. 242; Mac., Fl. Can. I, 207; Upham, Fl. Minn. 69; Cov., Fl. Ark. 189; Gray, Syn. Fl. I, 2, 109.

North America: W. Ont. to Minn., Mo. and Ark.

Minn. valley: Throughout; not infrequent; dry, barren, sandy or waste places.

HERB.: *Taylor* 1031, Glenwood; *Herrick* 137, Minneapolis; *Sandberg* 267, Goodhue Co.; *MacM.* and *Sheld.* 35, Brainerd; *MacM.* and *Sheld.* 35½, Brainerd [*forma solitaria* (MacM.)]; *Taylor* 1031½, Glenwood (*forma solitaria*).

Laciniaria squarrosa (LINN.) HILL. Syst. Veg. IV, 49 (1762).

Serratula squarrosa LINN. Spec. 88 (1753).

Pteronia caroliniana WALT. Fl. Car. 292 (1788).

Liatris squarrosa WILLD. Spec. III, 1065 (1802).

Wats. and Coult., Gray's Man. 6 ed. 242; Webb., Fl. Neb. 149; Chap., Fl. S. St. 191; Coult., Fl. Colo. 144; Upham, Fl. Minn. 68; Cov., Fl. Ark. 190; Mac., Fl. Can. I, 542; Gray, Syn. Fl. I, 2, 109; Coult., Fl. Tex. 182.

North America: Ont. to Penn. and Fla.; W. to Dak., Neb., Ark. and Tex.

Minn. valley: Reported as common in all districts; no Minn. specimens seen; dry prairies and meadows.

Laciniaria squarrosa (LINN.) HILL, var. **intermedia** (LINDL.)

Liatris intermedia LINDL. Bot. Reg. XX, t. 948 (1825).

L. squarrosa var. *intermedia* DC. Prodr. V. 129 (1836).

Wats. and Coult., Gray's Man. 6 ed. 242; Upham, Fl. Minn. 68; Coult., Fl. Colo. 144; Mac., Fl. Can. I, 542; Gray, Syn. Fl. I, 2, 109; Coult., Fl. Tex. 182.

North America: Ont. to Minn., Mo. and Tex.

Minn. valley: Reported from S. districts; no Minn. specimens seen; dry prairies and hillsides.

GRINDELIA WILLD. Ges. Nat. Mag. Berl. 259 (1807).

Donia R. BR. Hort. Kew. ed. 2, V, 82 (1813).

Demetria LAGASCA, Elench. Matr. 30 (1816).

Aurelia and **Astetilia** CASS. Dict. XXXVII, 468 (1826-1834).

Chrysophthalmum PHIL. Linn. XXIX, 9 (1855).

Baillon, *Hist. Pl.* VIII, 155 (sub *Hysterionica*); Benth. and Hook, *Gen. Pl.* II, 250; Durand, *Ind. Gen. Phan.* 193; Engler and Prantl, *Nat. Pflanz.* IV, 5, 148 (Hoffmann).

Living species: 25; N. America and extra-tropical S. America; S. America, from S. Brazil to Chile and Patagonia, 6-8; N. America, principally W. of the Mississippi; California, 10; Canada, 3; Rocky mts., 2; S. Sts., 1; E. Sts., 2; Pl. Wheel., 4; W. Tex., 3; numerous in Mexican highlands.

Grindelia squarrosa (PURSH) DUNAL, DC. Prodr. V, 315 (1836).

Donia squarrosa PURSH, Fl. Am. 559 (1814).

Aurelia amplexicaulis CASS. Dict. XXXVII, 468 (1829).

Grindelia subdecurrens DC. Prodr. V, 315 (1836).

G. arguta GRAY, Pl. Wright. II, 81 (1852).

Wats. and Coult., Gray's Man. 6 ed. 244; Webb., Fl. Neb. 149; Mac.,

Fl. Can. I, 208; Coult., Fl. Colo. 145; Upham, Fl. Minn. 77; Wats., King Exp. 163; Roth. Wheel. Exp. 141; Gray, Syn. Fl. I, 2, 118; Coult., Fl. Tex. 184.

North America: 64° N. lat. in Brit. Col. to Red and Saskatchewan valleys; S. to Colo. and Tex. and Mex.; W. to Sierra Nevada mts.; E. to C. Minn. and Neb.

Minn. valley: S. W. and W. districts; prairies, roadsides and fields.

HERB.: *Sheldon* 1433, Pipestone Co.; *Leiberg* 35, Rock Co.

DIPLOGON RAF. Am. Mo. Mag. (Jan. 1818).

Chrysopsis NUTT. Gen. II, 150 (1818).

Ammodia, **Macronema** (*part*), **Pityopsis** NUTT. Trans. Phil. Soc. ser. 2, VII, 321, 592, 317 (1841).

Hectorea DC. Prodr. V, 95 (1836).

Heyfeldera SCH.-BIP. Flora 35 (1853).

Baillon, *Hist. Pl.* VIII, 155 (*sub Hysterionica*); Benth and Hook., *Gen. Pl.* II, 252; Engler and Prantl, *Nat. Pflanz.* IV, 5, 149 (Hoffmann); Durand, *Ind. Gen. Phan.* 193; O. Kuntze, *Rev. Gen.* I, 333.

Living species: 20±; North America; 12 (Gray); 13 (Hoffmann); E. Sts., 6; S. Sts., 7-9; California, 4; Canada, 1; W. Tex., 3.

Diplogon villosum (PURSH) OK. Rev. Gen. I, 334 (1891).

Amellus villosus PURSH, Fl. Am. 564 (1814).

Diplopappus villosus and *hispidus* HOOK. Fl. Bor.-Am. II, 22 (1840).

Chrysopsis villosa NUTT. Trans. Phil. Soc. VII, 317 (1841).

C. canescens T. and G. Fl. II, 256 (1841).

C. echioides BENTH. Bot. Sulph. 25 (1844).

Wats. and Coult., Gray's Man., 6 ed. 245; Webb., Fl. Neb. 149; Chap., Fl. S. St. 217; Coult., Fl. Colo. 145; Upham, Fl. Minn. 78; Mac., Fl. Can. I, 209; Roth., Wheel. Exp. 141; Wats., King Exp. 164, 422; Cov., Fl. Ark. 190; Engl. Hoffmann, *Nat. Pflanz.* IV, 5, 149; Gray, Syn. Fl. I, 2, 122; Coult., Fl. Tex. 185.

North America: Peace and Saskatchewan regions to Ills. and Alabama; W. to Brit. Col., Calif., Nev. and Colo.

Minn. valley: Throughout; dry fields, prairies and forest openings.

HERB.: *MacMillan* 7, Glenwood; *Sheldon* 1369, Lake Benton; *Ballard* 640, Chaska; *Ballard* 377, Jordan, Scott Co.; *Ballard* 181, Jordan, Scott Co.; *Taylor* 744, Glenwood; *Herrick* 153, Minneapolis; *Sandberg* 308, Goodhue Co.; *Kassube* 134, Minneapolis; *Oestlund* 93, Minneapolis; *MacM.* and *Sheld.* 46, Brainerd; *Herb. Wickersheim* 78, Idlewild, Lincoln Co.; *Herb. Moyer* 130, Appleton.

SOLIDAGO LINN. Gen. 651 (1737).**Euthamia** NUTT. Gen. II, 162 (1818).**Chrysoma** NUTT. Jour. Acad. Phil. VII, 67 (1834).**Amphiraphis** DC. Prodr. V, 343 (1836) *part.***Virga-aurea** TOURN. Inst. 483 (1700).**Doria** ADANS. Fam. II, 124 (1763).

Baillon, *Hist. Pl.* VIII, 153; Benth. and Hook., *Gen. Pl.* II, 256; Durand, *Ind. Gen. Phan.* 194; O. Kuntze, *Rev. Gen.* I, 311 (*sub Aster*); Engler and Prantl, *Nat. Pflanz.* 4, V, 150 (Hoffmann).

Living species: 80±; all North America but 3 or 4; Russia, 1-2; Europe, 1-2; S. America, 2; Azores, 1; S. Sts., 45; E. Sts., 42; Canada, 33; Rocky mts., 14; California, 7; Pl. King, 12; Pl. Wheel., 14; W. Tex., 24.

Solidago occidentalis NUTT. T. and G. Fl. II, 226 (1841).*Euthamia occidentalis* NUTT. Trans. Am. Phil. Soc. VII, 326 (1841).*Solidago lanceolata* CHAM. and SCHLECHT. Linn. VI, 502 (1831) *not Linn.**Aplopappus baccharioides* BENTH. Bot. Sulph. 24 (1844).

Upham, Fl. Minn. 77; Coult., Fl. Colo. 155; Brew. and Wats., Fl. Calif. I, 318; Mac., Fl. Can. I, 217; Roth., Wheel. Exp. 364; Wats., King Exp. 156; Gray, Syn. Fl. I, 2, 160.

North America: S. Brit. Col. to Mont. and N. Mex.; W. to Pac. coast and S. Colo.; E. to W. Minn.

Minn. valley: Local in Nicollet Co.; perhaps also on Coteau des Prairies; S. W.; hills and high plains.

Solidago graminifolia (LINN.) ELL. Sk. II, 391 (1824).*Chrysocoma graminifolia* LINN. Spec. 841 (1753).*Solidago lanceolata* LINN. Mant. 114 (1767).*Euthamia graminifolia* NUTT. Gen. II, 162 (1818).

Wats. and Coult., Gray's Man. 6 ed. 252; Britt., Fl. N. J. 135; Webb., Fl. Neb. 149; Mac., Fl. Can. I, 217; Upham, Fl. Minn. 77; Chap., Fl. S. St. 214; Coult., Fl. Colo. 156; Wats., King Exp. 156; Cov., Fl. Ark. 190; Gray, Syn. Fl. I, 2, 160.

North America: Gulf of St. Lawrence to Rockies; N. to lat. 64°; S. to Mont., Colo., Neb., Ark.; E. to Atl. coast and Ga.

Minn. valley: Throughout; prairies, moist fields or hillsides.

HERB.: *Taylor* 960, Glenwood; *Sheldon* 1533, Lake Benton; *Sheldon* 1359, Verdi, Lincoln Co.; *Sheldon* 1461, Pipestone; *Ballard* 788, Swan lake, Carver Co.; *Ballard* 562, Prior's lake, Scott Co.; *Taylor* 960, Glenwood; *Sheldon* 993, Sleepy Eye; *Herrick* 152, Minneapolis; *Oestlund* 92, Minneapolis; *Kassube* 133, Ramsey Co.; *Bailey* 255, Vermilion lake; *Sandberg* 307, Goodhue Co.; *Roberts* 62, Cascade river; *Roberts* 63, Two Harbors.

Solidago riddellii FRANK. Ridd. Syn. 57 (1835).*S. amplexicaulis* MART. Bull. Acad. Brux. VIII, 68 (1841).

Wats. and Coult., Gray's Man. 6 ed. 252; Upham, Fl. Minn. 76; Gray, Syn. Fl. I, 2, 160.

North America: Ohio to Minn. and Mo.; Ft. Monroe, Virginia.

Minn. valley: Reported from forest district, N. E. and S. central portions; peat bogs and marshy places.

Solidago rigida LINN. Spec. 880 (1753).*S. grandiflora* RAF. Med. Repos. V, 359 (1808).

Wats. and Coult., Gray's Man. 6 ed. 252; Britt., Fl. N. J. 133; Webb., Fl. Neb. 149; Coult., Fl. Colo. 155; Chap., Fl. S. St. 210; Mac., Fl. Can. I, 217, 543; Cov., Fl. Ark. 191; Upham, Fl. Minn. 76; Gray, Syn. Fl. I, 2, 159; Coult., Fl. Tex. 190.

North America: Ont. to N. J. and mts. of Ga.; W. to Saskatchewan and N. W. T., Colo., Minn., Neb., Tex.

Minn. valley: Throughout; abundant; prairies and copses or waste hillsides, roadsides and embankments.

HERB.: *Sheldon* 505, Waseca; *Sheldon* 1451, Pipestone; *Taylor* 167, Janesville; *Taylor* 689, Minnesota lake; *Taylor* 825, Glenwood; *Sheldon* 1286, Lake Benton; *Sheldon* 1126, Springfield; *Sheldon* 471, Madison Lake; *Holzinger* 116, Winona Co.; *Kassube* 131, Minneapolis; *Sandberg* 303, Cannon Falls; *Herb. Sheld.* 1656, Minneapolis; *Herb. Wickersheim* 74, Ash lake, Lincoln Co.; *Herb. Moyer* 124, Montevideo.**Solidago radula** NUTT. Jour. Acad. Phil. VII, 327 (1835).*S. rotundifolia* DC. Prodr. V, 332 (1836).*S. scaberrima* T. and G. Fl. II, 220 (1841).*S. decemflora* GRAY, Pl. Lindh. II, 223 (1849).

Wats. and Coult., Gray's Man. 6 ed. 251; Upham, Fl. Minn. 76; Wats., King Exp. 155; Cov., Fl. Ark. 191; Gray, Syn. Fl. I, 2, 158; Webb., Appx. Neb. 43; Coult., Fl. Tex. 190.

North America: W. Ill., Minn., Kan., Neb. to N. Mex., Ark., Tex. and W. La.

Minn. valley: Reported from S. central and W. districts and from N. edge; rare; dry hills and high plains.

Solidago nemoralis AIT. Hort. Kew. III, 213 (1789).*S. hispida* MUHL. Willd. Spec. III, 2063 (1803).*S. conferta* POIR. Enc. Meth. VIII, 459 (1808).*S. cinerascens* SCHWEIN. Ell. Sk. II, 375 (1824).*S. decemflora* DC. Prodr. V, 322 (1836).*S. puberula* DC. Prodr. V, 333 (1836).

Wats. and Coult., Gray's Man. 6 ed. 251; Britt., Fl. N. J. 135; Webb., Fl. Neb. 149; Chap., Fl. S. St. 214; Mac., Fl. Can. I, 216; Coult., Fl. Colo. 155; Upham, Fl. Minn. 76; Cov., Fl. Ark. 191; Roth., Wheel, Exp. 149; Wats., King Exp. 155; Gray, Syn. Fl. I, 2, 158; Coult., Fl. Tex. 190.

North America: Anticosti to Rockies; S. to Fla., Nev., Tex., Mex., Arizona, Utah,

Minn. valley: Throughout; more abundant W. than E.; woodland and thickets.

HERB.: *Sheldon* 945, Redwood Falls; *Sheldon* 1257, Lake Benton; *Sheldon* 1473, Pipestone; *Sheldon* 1354, Verdi, Lincoln Co.; *Sheldon* 1198, New Ulm; *Herb. Wickersheim* 75, Idlewild, Lincoln Co.; *Sandberg* 121½, Red Wing; *Roberts* 36½, Minnesota Point; *Oestlund* 49½, Hennepin Co.; *Kassube* 126½, Minneapolis; *Holzinger* 42½, Winona Co.; *Holzinger* 43½, Winona Co.

***Solidago nemoralis* AIT. var. *mollis* (BARTL.).**

S. mollis BARTL. Ind. Sem. Hort. Gött. (1836).

S. incana T. and G. Fl. II, 221 (1841) *excl. syn.*

S. nemoralis var. *incana* GRAY, Proc. Am. Acad. XVII, 197 (1882).

Wats. and Coult., Gray's Man. 6 ed. 251; Coult., Fl. Colo., 155; Mac., Fl. Can. I, 217; Upham, Fl. Minn. 76; Gray, Syn. Fl. I, 2, 158; Webb., Appx. Neb. 43.

North America: N. W. T., 49° N. lat. to Colo.; E. to Dak., Minn., Mont., Neb. and in Mexico.

Minn. valley: Far W. district; rare; high or dry prairies.

HERB.: *Sheldon* 1500, Lake Benton.

***Solidago canadensis* LINN. Spec. 878 (1753).**

S. reflexa AIT. Hort. Kew. III, 210 (1789).

S. nutans DESF. Cat. 3 ed. 402 (1829).

S. longifolia SCHRAD. DC. Prodr. V, 330 (1836).

Wats. and Coult., Gray's Man. 6 ed. 251; Upham, Fl. Minn. 76; Britt., Fl. N. J. 135; Coult., Fl. Colo. 154; Webb., Fl. Neb. 148; Chap., Fl. S. St. 214; Mac., Fl. Can. I, 216; Herd., Fl. Eur. Russ. 66; Roth., Wheel. Exp. 147; Cov., Fl. Ark. 190; Gray, Syn. Fl. I, 2, 157; Coult., Fl. Tex. 190.

Introduced in Russia.

North America: Ft. Franklin on Mackenzie to Arizona; E. to N. S., N. J., N. Car. and Fla.

Minn. valley: Throughout; abundant; borders of woods and along railway embankments

HERB.: *Ballard* 779, Swan lake, Carver Co.; *Ballard* 728, Benton, Carver Co.; *Ballard* 875, Waconia; *Sheldon* 1478, Pipestone Co.; *Sheldon* 1581, Lake Benton; *Bailey* 533, Mud lake; *Roberts* 61, Poplar river; *Holzinger* 117, Winona Co.; *Bailey* 168, Vermilion lake; *Herrick* 151, Minneapolis; *Holzinger* 118, Winona Co.; *Sandberg* 305, Goodhue Co.; *Kassube* 132, Minneapolis; *Herb. Sheld.* 1727, Minneapolis; 1643, St. Paul; *Herb. Wickersheim* 77, Ash lake, Lincoln Co.; *Herb. Moyer* 125, Chippewa river, near Montevideo; 126, Montevideo.

Solidago serotina AIT. Hort. Kew. III, 211 (1789).*S. gigantea* WILLD. Spec. III, 2056 (1803).*S. glabra* DESF. Cat. 3 ed. 402 (1829).*S. fragrans* DESF. Hort. Par. (1829).*S. pitcheri* NUTT. Journ. Acad. Phil. VII, 101 (1834).

Wats. and Coult., Gray's Man. 6 ed. 251; Britt., Fl. N. J. 135; Webb., Fl. Neb. 149; Coult., Fl. Colo. 154; Upham, Fl. Minn. 77; Chap., Fl. S. St. 214; Mac., Fl. Can. I, 215; Cov., Fl. Ark. 191; Engl. Hoffmann, Nat. Pflanz. IV, 5, 150; Gray, Syn. Fl. I, 2, 156; Coult., Fl. Tex. 190.

North America: N. S., N. Br., Ont. to Saskatchewan, N. W. T. and 49° N. lat. on Red river; S. from Oregon to Tex.; E. to Atl. coast and Alabama.

Minn. valley: Throughout; edges of woods and open places or sunny banks of streams.

HERB.: *Sheldon* 471, Madison Lake; *Taylor* 1018, Glenwood; *Sheldon* 1268, Lake Benton; *Holzinger* 119, Winona Co.; *Sandberg* 306, Red Wing; *Sheldon* 1527, Lake Benton; *Herb. Moyer* 127, 128, 129, Montevideo.

Solidago serotina AIT. var. **gigantea** (AIT.) GRAY, Proc. Am. Acad. XVII, 179, 196 (1882).*S. gigantea* AIT. Hort. Kew. III, 211 (1789).*S. serotina* WILLD. Spec. III, 2056 (1803).

Wats. and Coult., Gray's Man. 6 ed. 251; Mac., Fl. Can. I, 216; Britt., Fl. N. J. 135; Chap., Fl. S. St. 214; Upham, Fl. Minn. 76; Wats., King Exp. 156; Gray, Syn. Fl. I, 2, 156; Webb., Appx. Neb. 43; Coult., Fl. Tex. 190.

North America: Newf., N. S., N. Br. to Pac.; N. to 59° on Peace river; S. to Tex. and Fla.; W. to Nev. on plains.

Minn. valley: Throughout; especially W. and N. W.; copses, thickets and embankments on river banks.

HERB.: *Taylor* 986, Glenwood.

Solidago missouriensis NUTT. Journ. Acad. Phil. VII, 32 (1834).*S. serotina* HOOK. Comp. Bot. Mag. I, 97 (1835).*S. glaberrima* MART. Bull. Acad. Brux. VIII, 68 (1841).

Wats. and Coult., Gray's Man. 6 ed. 251; Webb., Fl. Neb. 149; Upham, Fl. Minn. 76; Mac., Fl. Can. I, 215; Coult., Fl. Colo. 154; Roth., Wheel. Exp. 147; Cov., Fl. Ark. 191; Gray, Syn. Fl. I, 2, 155; Coult., Fl. Tex. 190.

North America: Assiniboia to Colo., Neb., Ark., Tex.; Wisc., Ind. and Tenn.

Minn. valley: Prairie district, especially W.; reported from N. E. districts; doubtful; high plains and headlands.

HERB.: *Sheldon* 1441, Pipestone; *Sheldon* 947, Redwood Falls; *Sheldon* 1178, New Ulm; *Sheldon* 1280, Lake Benton;

Taylor 768, Glenwood; *Sheldon* 1125, Springfield; *Huntington* 5, Luverne; *Herb. Wickersheim* 76, Ash lake, Lincoln Co.

***Solidago juncea* AIT.** Hort. Kew. III, 213 (1789).

S. ciliaris MUHL. Willd. Spec. III, 2056 (1803).

S. arguta T. and G. Fl. II, 214 (1841).

S. arguta var. *juncea* GRAY, Man. ed. V, 243 (1867).

Wats. and Coult., Gray's Man. 6 ed. 250; Britt., Fl. N. J. 134; Mac., Fl. Can. I, 215; Upham, Fl. Minn. 76; Gray, Syn. Fl. I, 2, 155.

North America: N. Br., Q., Ont. to Rockies, 44°, 54° and 64° N. lat. and Hudson Bay reg.; S. to N. J., Penn. and S. Car.; W. to Tenn. and Minn.

Minn. valley: N. E. districts; rare further S. in forest district; banks of streams and edges of woods.

HERB.: *Bailey* 31, Vermilion lake; *Sandberg* 304, Goodhue Co.

***Solidago neglecta* T. and G.** Fl. II, 213 (1841).

Wats. and Coult., Gray's Man. 6 ed. 250; Britt., Fl. N. J. 133; Upham, Fl. Minn. 76; Mac., Fl. Can. I, 214; Gray, Syn. Fl. I, 2, 154.

North America: N. Br., Q., Ont., N. J. to Md.; W. to Minn.

Minn. valley: Reported from S. E. districts; doubtful; swamps.

***Solidago rugosa* MILL.** Dict. ed. 8 (1768).

S. aspera AIT. Hort. Kew. III, 212 (1789).

S. altissima AIT. Hort. Kew. III, 212 (1789).

? *S. rigidula* BOSC. Hort. Par. (1808).

S. asperata HERB. Banks (*Solander*),

S. hirta WILLD. Enum. 891 (1809).

S. villosa PURSH, Fl. Am. II, 537 (1814).

S. humilis DESF. Cat. ed. 3, 402 (1829).

S. asperula DESF. Cat. ed. 3, 403 (1829).

S. altissima T. and G. Fl. II, 216 (1841).

Wats. and Coult., Gray's Man. 6 ed. 249; Britt., Fl. N. J. 135; Chap., Fl. S. St. 212?; Mac., Fl. Can. I, 214; Upham, Fl. Minn. 76; Cov., Fl. Ark. 191; Gray, Syn. Fl. I, 2, 153; Coult., Fl. Tex. 189..

North America: N. S., N. Br., Q., Ont. to Thunder bay; S. to Fla., Mo. and Ark.; W. to Minn. and Tex.

Minn. valley: Reported from S. central district; rare; fields and borders of thickets.

***Solidago patula* MUHL.** Willd. Spec. III, 2059 (1803).

S. asperata PURSH, Fl. Am. II, 538 (1814).

S. angulata SPRENG. in herb. Willd.

S. frankii HOCHST. and STEUD. in Dist.

Wats. and Coult., Gray's Man. 6 ed. 249; Mac., Fl. Can. I, 214; Gray, Syn. Fl. I, 2, 152; Chap., Fl. S. St. 211; Upham, Fl. Minn. 76; Britt., Fl. N. J. 134; Coult., Fl. Tex. 189.

North America: Ont. to Minn.; S. to Ga., Mo. and Tex.

Minn. valley: Reported from S. E. district; doubtful; swamps and wet meadows.

Solidago speciosa NUTT. Gen. II, 160 (1818).

S. sempervirens MICHX. Fl. N. Am. II, 119 (1803) *in part*.

S. petiolaris MUHL. Cat. 79 (1813).

Wats. and Coult., Gray's Man. 6 ed. 249; Britt., Fl. N. J. 133; Chap., Fl. S. St. 210; Mac., Fl. Can. II, 214; Upham, Fl. Minn. 75; Cov., Fl. Ark. 191; Gray, Syn. Fl. I, 2, 152; Webb., Appx. Neb. 43; Coult., Fl. Tex. 189.

North America: N. S., N. Br. to Fla. and Miss.; W. to Minn., Neb. and Ark.

Minn. valley: Forest district and W. to Chippewa valley; rare; edges of woods and thickets.

HERB.: *Sandberg* 302, Red Wing; *Taylor* 946, Glenwood.

Solidago speciosa var. **rigidiuscula** T. and G. Fl. II, 205 (1841).

Wats. and Coult., Gray's Man. 6 ed. 249; Webb., Fl. Neb. 149; Coult., Fl. Colo. 153; Upham, Fl. Minn. 75; Cov., Fl. Ark. 191; Gray, Syn. Fl. I, 2, 152; Coult., Fl. Tex. 189.

North America: Minn., Neb., Colo. to Arizona and Texas.

Minn. valley: Reported from S. W. districts; doubtful; copses and edges of woods.

Solidago speciosa NUTT. var. **erecta** (PURSH).

S. erecta PURSH, Fl. Am. 542 (1814).

S. speciosa var. *angustata* T. and G. Fl. II, 205 (1841).

Wats. and Coult., Gray's Man. 6 ed. 249; Britt., Fl. N. J. 133; Webb., Fl. Neb. 149; Chap., Fl. S. St. 210; Upham, Fl. Minn. 75; Gray, Syn. Fl. I, 2, 152; Coult., Fl. Tex. 189.

North America: N. Eng., N. J. to Fla. and Miss.; W. to Minn., Neb. and Tex.

Minn. valley: Reported from S. edge; doubtful; copses and edges of woods.

Solidago latifolia LINN. Spec. 879 (1753).

S. flexicaulis LINN. Spec. 879 (1753).

S. flexicaulis var. *latifolia* WILLD. Spec. III, 2064 (1803).

S. macrophylla BIGEL. Fl. Bost. 2 ed. 305 (1824).

Wats. and Coult., Gray's Man. 6 ed. 247; Britt., Fl. N. J. 132; Upham, Fl. Minn. 75; Chap., Fl. S. St. 208; Mac., Fl. Can. II, 211; Gray, Syn. Fl. I, 2, 145.

North America: N. S., N. Br., Q., Ont. to Georgian bay; S. to N. J. and N. Car.; W. to Minn., Mo., Tenn., Ga.

Minn. valley: Throughout; edges of woods and along shaded banks of streams and lakes.

HERB.: *Sheldon* 23, Elysian; *Sheldon* 656, Waseca; *Sheldon* 1276, Lake Benton; *Taylor* 1043, Glenwood; *Sandberg* 300, Vasa; *Kassube* 130, Minneapolis; *Herrick* 149, Minneapolis; *Taylor* 1164, Glenwood; *Herb. Wickersheim* 72, Lake Park, Becker Co., 73, Lake Benton; *Herb. Moyer* 123, Montevideo.

Solidago caesia LINN. Spec. 879 (1753).

S. flexicaulis LINN. Herb.

Wats. and Coult., Gray's Man. 6 ed. 247; Britt., Fl. N. J. 132; Upham, Fl. Minn. 75; Chap., Fl. S. St. 209; Mac., Fl. Can. II, 211; Cov., Fl. Ark. 190; Gray, Syn. Fl. I, 2, 145; Coult., Fl. Tex. 188.

North America: Ont. to Fla.; W. to Minn., Ill., Ky., Ark. and Tex.

Minn. valley: N. E. district; infrequent; moist woods and banks.

HERB.: *Sandberg* 301, Red Wing; *Herrick* 150, Minneapolis.

HAPLOPAPPUS CASS. Dict. 56, 168 (1834).

Prionopsis NUTT. Trans. Phil. Soc. 2, VII, 329 (1843).

Pyrrocoma HOOK. Fl. Bor.-Am. I, 306 (1833).

Homopappus NUTT. l. c. 330 (1843).

Hoorebekia CORNELISS. ex DC. Prodr. V, 346 (1836).

Stenotus NUTT. l. c. 334 (1843).

Isopappus T. and G. Fl. Am. II, 239 (1841).

Chroilema BERNH. Hort. Erf. (1840).

Macronema NUTT. l. c. 331 (1843).

Baillon, *Hist. Pl.* VIII, 156 (sub *Hysterionica* Willd.); Benth. and Hook., *Gen. Pl.* II, 253; Durand, *Ind. Gen. Phan.* 193; Engler and Prantl, *Nat. Pflanz.* IV, 5, 150 (Hoffmann).

Living species: 100±; 60 (B. and H.); Western N. and S. America, Canada to Patagonia. Especially abundant in Chile. N. America and Mexico, 50±, E. Sts., 3; Canada, 6; Rocky mts., 18; California, 22; Pl. King, 14; Pl. Wheel., 15; W. Tex., 9

Haplopappus spinulosus (PURSH) DC. Prodr. V, 347 (1836).

Amellus(?) *spinulosus* PURSH, Fl. Am. 564 (1814).

Starkea pinnata NUTT. Gen. II, 169 (1818).

Diplopappus pinnatifidus HOOK. Fl. Bor.-Am. II, 22 (1840).

Dieteria spinulosa NUTT. Trans. Amer. Phil. Soc. VII, 301 (1841).

Wats. and Coult., Gray's Man. 6 ed. 245; Webb., Fl. Neb. 149; Coult., Fl. Colo., 148; Mac., Fl. Can. I, 209; Upham, Fl. Minn. 77; Roth., Wheel. Exp. 143; Wats., King Exp. 422; Engl. Hoffmann, *Nat. Pflanz.* IV, 5, 151; Gray, Syn. Fl. I, 2, 130; Gray, Suppl. Syn. I, 2, 446; Coult., Fl. Tex. 186.

North America: Rockies in Can. to 54° N. lat.; S. to Colo., Neb., Arizona, Tex. and Mex.; E. to Saskatchewan, Dak. and Minn.

Minn. valley: S. W. district; infrequent; plains and high knolls.

BOLTONIA L'HER. Sert. Angl. 27 (1788).

Asteromoea BLUME, Bij. 901 (1826).

Hisutsua DC. Prodr. VI, 44 (1837).

Dichaetophora A. GRAY, Pl. Fendl. 73 (1849).

Baillon, *Hist. Pl.* VIII, 34 (*sub Aster*); Benth. and Hook., *Gen. Pl.* II, 269; Durand, *Ind. Gen. Phan.* 196; Engler and Prantl, *Nat. Pflanz.* IV, 5, 161 (Hoffmann).

Living species: 7 in N. America and Malay Archipelago to Japan and China; U. S., 4; E. Asia, 3; Canada, 3; E. Sts., 3; S. Sts., 3; S. Tex., 1; W. Tex., 1.

Boltonia asteroides (LINN.) L'HER. Stirp. (1788).

Matricaria asteroides LINN. Mant. 116 (1767).

M. glastifolia HILL. Hort. Kew. 19 (1768).

Boltonia glastifolia L'HER. Stirp. (1788).

Chrysanthemum carolinianum WALT. Fl. Car. 204 (1788).

Wats. and Coult., Gray's Man. 6 ed. 254; Webb., Fl. Neb. 148; Chap., Fl. S. St. 208; Upham, Fl. Minn. 74; Mac., Fl. Can. II, 332; Gray, Syn. Fl. I, 2, 166.

North America: Man. and Minn. to Neb. and Mo.; E. to Penn., N. Car. and Fla.

Minn. valley: Throughout, especially W. and S. W. districts; rich soil and edges of woods.

HERB.: *Sheldon 1421*, Lake Benton; *Taylor 1186*, Glenwood; *Juni 8*, Alexandria; *Oestlund 91*, Minneapolis; *Sandberg 299*, Red Wing; *Herb. Wickersheim 71*, Ash lake, Lincoln Co.; *Herb. Moyer 122*, Montevideo.

ASTER LINN. Gen. 652 (1737).

Sericocarpus NEES, Gen. Ast. 148 (1818).

Biotia, **Heliastrium**, **Heterochaeta**, **Arctogeron**, **Turczaninowia**, **Noticastrum**, **Galatella** DC. Prodr. V (1836).

Diplopappus, **Galatea**, **Linosyris**, **Crinitaria** CASS. Dict. XIII, seq. (1834).

Xylorhiza and **Eucephalus** NUTT. Trans. Phil. Soc. 2, VIII, 298 (1841).

Symphyotrichum, **Machaeranthera**, **Doellingeria**, **Tripolium**, **Callimeris** NEES, Ast. (1832).

Dieteria NUTT. l. c. 300 (1841).

Rhinactina LESS. Linn. VI, 149 (1832).

Homostylium NEES, Linn. XVIII, 513 (1844).

Bellidiastrum MICHEL, Nov. Gen. 29 (1729).

Margarita GAUD. Helv. V, 335 (1829).

Hersilea KLOTZSCH, Waldem. Reis. Bot. 75 (1843?).

? **Psychrogeton** BOISS. Fl. Or. III, 156 (1843).

Amellus ADANS. Fam. Pl. II, 124 (1763).

Pinardia NECK. Elem. I, 5 (1790).

Crinita MOENCH, Meth. (1794).

Baillon, *Hist. Pl.* VIII, 135; Benth. and Hook., *Gen. Pl.* II, 270, 271; Durand, *Ind. Gen. Phan.* 196; O. Kuntze (includes *Solidago*), *Rev. Gen.* I, 309; Engler and Prantl, *Nat. Pflanz.* IV, 5, 161 (Hoffmann).

Living species: 350 described, 250 reduced. N. and S. America, Europe, Asia, S. Africa, and closely related forms perhaps to be referred to the genus in Australia. Russia, 20; Europe, 10; North America 150, (124, Gray Syn.); Canada, 60-70; Rocky mts., 50; E. Sts., 60; S. Sts., 50; California, 20; Pl. Wheel., 20; Pl. King, 20; W. Tex., 25.

Aster ptarmicoides (NEES) T. and G. Fl. II, 160 (1841).

Doellingeria ptarmicoides NEES, Syn. Ast. 183 (1818).

Chrysopsis alba NUTT. Gen. II, 152 (1818).

Heliastrum album DC. Prodr. V, 264 (1836).

Diplopappus albus HOOK. Fl. Bor.-Am. II, 21 (1840).

Aster albus EAT. and WRIGHT, Man. 146 (1840).

Wats. and Coult., Gray's Man. 6 ed. 264; Mac., Fl. Can. I, 228; Coult., Fl. Colo. 165; Upham, Fl. Minn. 73; Cov., Fl. Ark. 192; Gray, Syn. Fl. I, 2, 198.

North America: Ont. and N. Eng. to Saskatchewan, Assiniboia and N. W. T. to 49° N. lat.; S. to Minn., Colo. and Arkansas.

Minn. valley: Throughout at higher levels; fields, prairies, high bluffs and rocky headlands.

HERB.: *Sheldon 1254*, Lake Benton; *Taylor 1007*, Glenwood; *Juni 7*, Knife river; *Juni 8*, Little Marais; *Kassube 126*, Minneapolis; *Bailey 517*, Agate bay; *Roberts 59*, Little Marais; *Leiberg 32*, Blue Earth Co.; *Holzinger 112*, Winona Co.; *Sandberg 292*, Goodhue Co.; *MacM. and Sheld. 19*, Brainerd; *Herb. Wickersheim 69*, Idlewild, Lincoln Co.; *Herb. Moyer 116*, Minnesota bluffs, near Montevideo.

Aster umbellatus MILL. Dict. ed. 8, 2 (1768).

A. amygdalinus LAM. Enc. Meth. I, 305 (1783).

Chrysopsis amygdalina NUTT. Gen. II, 153 (1818).

Diplopappus umbellatus T. and G. Fl. II, 183 (1841).

D. amygdalinus T. and G. Fl. II, 153 (1841) *in part*.

Wats. and Coult., Gray's Man. 6 ed. 263; Britt., Fl. N. J. 140; Chap., Fl. S. St. 207; Mac., Fl. Can. I, 229; Cov., Fl. Ark. 192; Gray, Syn. Fl. I, 2, 196; Coult., Fl. Tex. 196.

North America: Newf., Anticosti, N. S., N. Br. to N. J., Tenn. and Ga.; W. to Saskatchewan, Minn. and Ark.

Minn. valley: Throughout, principally W. districts; moist woods and shaded banks of streams and lakes.

HERB.: *Taylor 991*, Glenwood; *Taylor 1015*, Glenwood; *Taylor 1045*, Glenwood; *Sheldon 1157*, New Ulm;—all in var.

pubens Gray; *Leiberg* 33, Blue Earth Co.; *Bailey* 473, Agate Bay;—Type; *Bailey* 190, Vermilion lake; *Arthur* 66, Vermilion lake—also var. *pubens* Gray.

Aster puniceus LINN. Spec. 875 (1753).

A. hispidus LAM. Enc. Meth. I, 306 (1783).

A. amoenus LAM. Enc. Meth. I, 306 (1783).

Wats. and Coult., Gray's Man. 6 ed. 263; Britt., Fl. N. J. 139; Chap., Fl. S. St. 204; Upham, Fl. Minn. 73; Mac., Fl. Can. I, 226; Coult., Fl. Colo. 164; Cov., Fl. Ark. 192; Gray, Syn. Fl. I, 2, 195; Webb., Appx. Neb. 43.

North America: Atl. to Pac. in Can.; S. in E. U. S. to N. Car. and Ga.; W. to Minn., Dak., Neb. and Mont. to Colo.

Minn. valley: Especially in W. districts, but probably throughout; low places and edges of swampy woods.

HERB.: *Taylor* 1092, Glenwood; *Sheldon* 1514, Lake Benton; *Sheldon* 1554, Verdi, Lincoln Co.; *Herb. Wickersheim* 65, Ash lake, Lincoln Co.; *Wickersheim* 137, Ash lake, Lincoln Co.

Aster puniceus LINN. var. **lucidus** (WEND.).

A. lucidus WEND. Ind. Sem. Marb. (1832).

A. puniceus var. *vimineus* T. and G. Fl. II, 140 (1841).

A. puniceus var. *lucidulus* GRAY, Syn. Fl. I, 2, 195 (1886).

Wats. and Coult., Gray's Man. 6 ed. 263; Upham, Fl. Minn. 73; Mac., Fl. Can. II, 333.

North America: E. Q. to N. Eng.; W. to Ills., Wisc. and Minn.

Minn. valley: W. and S. W. districts; rare; wet or low places.

HERB.: *Sheldon* 1335, Lake Benton.

Aster novabelgii LINN. Spec. 877 (1753).

A. serotinus MILL. Dict. (1768).

A. floribundus WILLD. Spec. III, 2048 (1803).

A. laxus T. and G. Fl. II, 134 (1841).

A. longifolius GRAY, Man. 5 ed. 233 (1867).

Wats. and Coult., Gray's Man. 6 ed. 262; Britt., Fl. N. J. 138; Webb., Fl. Neb. 148; Mac., Fl. Can. I, 225, 545; Chap., Fl. S. St. 203; Upham, Fl. Minn. 72; Engl. Hoffmann, Nat. Pflanz. IV. 5, 163; Gray, Syn. Fl. I, 2, 189.

North America: N. S.?, N. Br.? and Bow river reg. to Ga. and S. Car.; N. J. to Minn. and Neb.

Minn. valley: S. central districts and W. to Dakota line; rare; low places along streams and in meadows.

Aster longifolius LAM. Enc. Meth. I, 306 (1783) *chiefly*.

A. paniculatus LAM. in Herb. Par.

A. aestivus AIT. Hort. Kew. III, 203 (1789).

A. salicifolius WILLD. Herb.

A. floribundus WILLD. Herb. Par. (1814).

? *A. hiemalis* NEES, Ast. 77 (1832).

A. virgineus NEES, Ast. 88 (1832).

? *A. squarulosus* NEES, Ast. 86 (1832).

A. laxifolius HOOK. Fl. I, (1833).

A. longifolius var. *villicaulis* GRAY, Syn. Fl. I, 2, 189 (1886).

Wats. and Coult., Gray's Man. 6 ed. 262; Gray, Syn. Fl. I, 2, 188; Upham, Fl. Minn. 72; Coult., Fl. Colo. 161, *partly*; Mac., Fl. Can. I, 226.

North America: Labrador, N. N. Eng. to Ont., Man. and Great Slave lake; S. to Mont., Minn. and Colo.

Minn. valley: N. districts, E. and W.; woods and edges of thickets.

HERB.: *Taylor* 1115, Glenwood; *Ballard* 823, Page lake, Carver Co.; *Ballard* 795, Goose lake, Carver Co.; *Ballard* 716, Benton. Carver Co.; *Ballard* 840, Patterson lake, Carver Co.; *Bailey* 266, St. Louis river; *Sandberg* 608, Red Wing; *Oestlund* 352, Minneapolis.

Aster juncus AIT. Hort. Kew. III, 204 (1789).

A. salicifolius RICH. App. Frankl. Journ. 478 (1823).

A. bellidiflorus HOOK. Fl. Bor.-Am. II, 2 (1840).

A. laxifolius HOOK. Fl. Bor.-Am. II, 10 (1840).

A. laxifolius var. *borealis* T. and G. Fl. II, 138 (1841).

A. laxifolius var. *laetiflorus* T. and G. Fl. II, 138 (1841).

A. borealis PROVANCH. Fl. Can. I, 308 (1862).

A. aestivus GRAY, Man. 5 ed. 233 (1867) *mainly*.

Wats. and Coult., Gray's Man. 6 ed. 262; Britt., Fl. N. J. 139; Coult., Fl. Colo. 161; Upham, Fl. Minn. 72; Mac., Fl. Can. I, 545; Gray, Syn. Fl. I, 2, 188.

North America: Saskatchewan to N. S. and Brit. Col. to lat. 64° N. and at Hudson Bay; S. to N. Y. and N. J.; W. to Minn., Ohio and Mich.

Minn. valley: Reported as occurring throughout; rare; shaded places and along streams.

Aster salicifolius LAM.? Enc. Meth. I, 306 (1783).

? *A. eminens* WILLD. Enum. 886 (1809).

A. praealtus POIR. Suppl. I, 493 (1810).

A. rigidulus DESF. Cat. 122 (1815).

A. obliquus NEES, Syn. Ast. 76 (1818).

? *A. carneus* NEES, Syn. Ast. 96 (1818).

A. stenophyllus LINDL. DC. Prodr. V, 242 (1836).

A. laxifolius HOOK. Fl. Bor.-Am. II, 10 (1840) *pro parte*.

A. greenei T. and G. Fl. II, 134 (1841).

Wats. and Coult., Gray's Man. 6 ed. 261; Britt., Fl. N. J. 138; Coult., Fl. Colo. 161; Webb., Fl. Neb. 148; Upham., Fl. Minn. 72; Mac., Fl. Can. I, 224; Gray, Syn. Fl. I, 2, 188; Hart., Fl. Scand. I, 554?; Coult., Fl. Tex. 196?.

North America: N. S., Ont., Man. and Saskatchewan to N. Eng., N. J. and W. to Minn., Dak., Mont., Neb. and Tex.

Minn valley: Reported in W. districts, both N. and S.; rare; moist or low fields and meadows.

Aster paniculatus LAM. Enc. Meth. I, 306 (1783).

A. salicifolius SCHOLL. Fl. Barb. Suppl. 328 (1785).

A. salignus WILLD. Spec. III, 240 (1800).

A. dracunculoides WILLD. Spec. III, 2050 (1803).

A. simplex WILLD. Enum. 887 (1809).

A. laxus WILLD. Enum. 886 (1809).

A. strictus POIR. Suppl. 498 (1810).

A. carneus NEES, Syn. Ast. 27 (1818).

A. lamarckianus NEES, Syn. Ast. 100 (1818).

A. recurvatus WILLD. in *Herb.*

A. parviflorus HOOK. Fl. Bor.-Am. II, 11 (1841).

A. tenuifolius T. and G. Fl. II, 131 (1840).

Wats. and Coult., Gray's Man. 6 ed. 261; Britt., Fl. N. J. 138; Chap., Fl. S. St. 203; Mac., Fl. Can. I, 224; Coult., Fl. Colo. 161; Roth., Wheel. Exp. 150; Wats., King Exp. 140; Cov., Fl. Ark. 192; Gray, Syn. Fl. 187; Webb., Appx. Neb. 43.

North America: N. Br. to Saskatchewan and Mont.; S. to N. Eng., N. J. and La.; W. to Minn., Neb. and Ark.

Minn. valley: Throughout; principally in W. districts; shaded banks or edges of woods.

HERB.: *Sheldon* 1425, Lake Benton; *Roberts* 58, Stewart river; *Sandberg* 290, Red Wing; *Bailey* 217, Vermilion lake; *Taylor* 1091, Glenwood; *Sheldon* 925, Sleepy Eye; *Herb. Moyer* 265, Montevideo.

Aster lateriflorus (LINN.) BRITT. Trans. N. Y. Acad. IX, (1889).

Solidago lateriflora LINN. Spec. 879 (1753).

Aster diffusus AIT. Hort. Kew. III, 205 (1789).

A. tradescanti MICHX. Fl. II, 115 (1803).

A. miser NUTT. Gen. II, 158 (1818).

A. parviflorus DARL. Fl. Cestr. 446 (1840).

A. divergens HOOK. Fl. Bor.-Am. II, 11 (1840).

A. pendulus HOOK. Fl. Bor.-Am. II, 12 (1840).

A. glomerellus T. and G. Fl. II, 129 (1841).

Wats. and Coult., Gray's Man. 6 ed. 261; Upham, Fl. Minn. 72; Chap., Fl. S. St. 203?; Britt., Fl. N. J. 138; Mac., Fl. Can. I, 224; Gray, Syn. Fl. I, 2, 186; Coult., Fl. Tex. 196.

North America: N. S., N. Br., Q., Ont. and Minn. to Fla. and Tex.

Minn. valley: Reported as occurring throughout; fields, edges of woods and along streams.

HERB.: *Sandberg* 289, Red Wing; *Roberts* 57, Beaver bay.

Aster vimineus LAM. Enc. Meth. I, 306 (1783).

A. tradescanti LINN. Herb. Cliff?.

A. secundiflorus DESF. Hort. Par. (1815).

A. multiflorus NUTT. Gen. II, 155 (1818).

A. fragilis NEES, Ast. 101 (1818).

A. tenuifolius ELL. Sk. II, 347 (1824).

A. diffusus DC. Prodr. V, 242 (1836) *in part.*

Wats. and Coult. Gray's Man. 6 ed. 260; Britt., Fl. N. J. 138; Chap., Fl. S. St. 203?; Mac., Fl. Can. I, 226?, 546; Cov. Fl. Ark. 192; Gray, Syn. Fl. I, 2, 186.

North America: Ont. to N. Eng. and Va.; W. to Minn., Mo., Ark. and Fla.

Minn. valley: Reported from N. edge and said to extend W. and S.; doubtful; moist banks and edges of woods or marshes.

Aster dumosus LINN. Spec. 873 (1753).

A. sparsiflorus MICHX. Fl. II, 112 (1803).

A. fragilis LINDL. DC. Prodr. V, 246 (1836).

Wats. and Coult., Gray's Man. 6 ed. 260; Britt., Fl. N. J. 138; Mac., Fl. Can. I, 224, 546; Chap., Fl. S. St. 203; Cov., Fl. Ark. 191; Gray, Syn. Fl. I, 2, 185; Coult., Fl. Tex. 196.

North America: N. Eng. and Ont. to Minn.; S. to Fla., Tex. and Ark.

Minn. valley: Reported from S. E. and S. central districts; rare; woods and thickets; banks of streams.

HERB.: *Sandberg* 288, Red Wing.

Aster multiflorus AIT. Hort. Kew. III, 203 (1789).

A. ciliatus MUHL. Willd. Spec. III, 2024 (1803).

A. ericoides var. *multiflorus* PERS. Syn. II, 443 (1807).

A. scoparius DC. Prodr. V, 242 (1836).

A. hebecladus DC. Prodr. V, 242 (1836).

Wats. and Coult., Gray's Man. 6 ed. 260; Mac., Fl. Can. I, 223, 544; Webb., Fl. Neb. 148; Britt., Fl. N. J. 138; Coult., Fl. Colo. 161; Chap., Fl. S. St. 202; Roth., Wheel. Exp. 150; Wats., King. Exp. 191; Cov., Fl. Ark. 192; Gray, Syn. Fl. I, 2, 185; Coult., Fl. Tex. 195.

North America: Saskatchewan and Brit. Col.? to Mont., Arizona and Mexico; E. to Minn., Neb., Ont., N. Y., N. J., Va., Ga. and Tex.

Minn. valley: Throughout; dry places, banks of streams, shores of lakes; gravelly or sandy soil.

HERB.: *Sheldon* 1106, Springfield; *Taylor* 1068, Glenwood; *Sheldon* 1331, Lake Benton; *Sandberg* 287, Red Wing; *Herb. Sheld.* 1815, Minneapolis; *Herb. Wickersheim* 64, Idlewild, Lincoln Co.; *Herb. Moyer* 114, Montevideo.

Aster ericoides LINN. var. *villosus* (MICHX.) T. and G. Fl. II, 123 (1841).

A. villosus MICHX. Fl. N. Am. II, 113 (1803).

A. pilosus WILLD. Spec. III, 2055 (1803).

Wats. and Coult., Gray's Man. 6 ed. 260; Upham, Fl. Minn. 71; Mac., Fl. Can. I, 223; Chap., Fl. S. St. 202; Mac., Fl. Can. I, 544; Gray, Syn. Fl. I, 2, 184.

North America: Ont. to Minn. and Iowa; E. to N. Y., Ohio, Fla. and Miss.?

Minn. valley: S. central district and E. edge; rare; dry places and sunny banks of streams.

HERB.: ?*Holzinger* 110 Winona Co.

Aster polyphyllus WILLD. Enum. 888 (1809).

A. tenuifolius NEES, Syn. Ast. 119 (1818) *in part*.

Wats. and Coult. Gray's Man. 6 ed. 216; Chap., Fl. S. St. 203; Upham, Fl. Minn. 72; Gray, Syn. Fl. I, 2, 184.

North America: N. Vt. to Wisc. and Minn.; S. to N. Car.

Minn. valley: Reported from N. W. and S. central districts; low places and along streams.

Aster laevis LINN. Spec. 876 (1753).

A. rubricaulis LAM. Enc. Meth. I, 305 (1783).

A. amplexicaulis MUHL. Willd. Spec. III, 2046 (1803).

A. cyaneus HOFFM. Phyt. Blatt. 71 (1803).

A. pennsylvanicus POIR. Suppl. I, 498 (1810).

A. glaucescens and *impolitus* NEES, Syn. 23 (1818).

A. concinnus HOOK. Fl. II, 13 (1840).

A. strictus var. *angustifolius* HOOK. Fl. Bor.-Am. II, 13 (1840).

Wats. and Coult., Gray's Man. 6 ed. 259; Britt., Fl. N. J. 137; Webb., Fl. Neb. 148; Mac., Fl. Can. I, 221; Upham, Fl. Minn. 71; Coult., Fl. Colo. 160; Chap., Fl. S. St. 200; Cov., Fl. Ark. 192; Gray, Syn. Fl. I, 2, 183.

North America: Ont. to Saskatchewan and Rocky mts. to lat. 58° N. on Peace river; S. to N. Eng., N. J. and Va.; W. to Minn., Kan., Neb. and Ark.

Minn. valley: Throughout; at higher levels; dry woods and thickets.

HERB: *Taylor* 1124, Glenwood; *Sandberg* 282, Red Wing; *Sandberg* 283 Red Wing; *Herrick* 143, Minneapolis; *Herb. Wickersheim* 63, Idlewild, Lincoln Co.; *Herb. Moyer* 113, Montevideo; *Winchell* 21, Lake Minnetonka.

Aster drummondii LINDL. DC. Prodr. V, 246 (1836).

Wats. and Coult., Gray's Man. 6 ed. 259; Webb., Fl. Neb. 148; Upham, Fl. Minn. 71; Cov., Fl. Ark. 191; Gray, Syn. Fl. I, 2, 182; Coult., Fl. Tex. 195.

North America: Ill. to Minn., Neb., Kan. and Tex.

Minn. valley: Reported from S. E. district; no Minn. specimens seen.

Aster sagittaeifolius WILLD. Spec. III, 2035 (1803).

A. paniculatus MUHL. Cat. (1813).

A. hirtellus and *urophyllus* LINDL. DC. Prodr. V, 233 (1836).

Wats. and Coult., Gray's Man. 6 ed. 259; Upham, Fl. Minn. 71; Britt., Fl. N. J. 138; Mac., Fl. Can. I, 222; Webb., Fl. Neb. 148; Chap., Fl. S. St. 202; Coult., Fl. Colo. 160; Cov., Fl. Ark. 192; Gray, Syn. Fl. I, 2, 182.

North America: N. Br., Ont., N. Y., N. J. and Penn. to Ky. and Fla.; W. to Minn., Dak., Neb. and Ark.

Minn. valley: N. edge, N. E. and N. W. districts; higher levels; dry places and edges of woods.

HERB.: *Sandberg* 286, Red Wing; *Bailey* 458, Mud lake; *Bailey* 269, Vermilion lake; *Bailey* 270, Vermilion lake; *Herrick* 144, Minneapolis; *Holtz* 17, Minneapolis.

Aster cordifolius LINN. Spec. 875 (1753).

A. paniculatus and *heterophyllus* WILLD. Spec. III, 2035 (1803).

A. paniculatus, *heterophyllus* and *cordifolius* NEES, Ast. (1818).

Wats. and Coult., Gray's Man. 6 ed. 259; Webb., Fl. Neb. 148; Britt., Fl. N. J. 137; Mac., Fl. Can. I, 222; Chap., Fl. S. St. 202; Upham, Fl. Minn. 71; Cov., Fl. Ark. 191; Gray, Syn. Fl. I, 2, 182.

North America: N. S., N. Br., Q., Ont. to Georgian bay; S. to Va., Ky., Neb., Mo. and Ark.

Minn. valley: Throughout the forest district; woods and thickets.

HERB.: *Sandberg* 285 Red Wing.

Aster undulatus LINN. Spec. 875 (1753).

A. paniculatus NUTT. Gen. II, 56 (1818).

A. sagittaeifolius ELL. Sk. II, 362 (1824).

A. diversifolius DC. Prodr. V, 234 (1836).

Wats. and Coult., Gray's Man. 6 ed. 258; Webb., Fl. Neb. 148; Upham, Fl. Minn. 71; Mac., Fl. Can. I, 222; Chap., Fl. S. St. 201; Britt., Fl. N. J. 137; Mac., Fl. Can. I, 544; Cov., Fl. Ark. 192; Gray, Syn. Fl. I, 2, 181.

North America: N. Br., Ont. to N. J., N. Car., Fla.; W. to Minn., Ky., Ark. and Neb.

Minn. valley: S. central district and N. W.; rare; dry woods and thickets.

HERB.: ?*Taylor* 1014, Glenwood.

Aster azureus LINDL. DC. Prodr. V, 244 (1836).

A. oolentangiensis RIDD. Cat. Pl. W. S. (1835).

Wats. and Coult., Gray's Man. 6 ed. 258; Upham, Fl. Minn. 71; Mac., Fl. Can. I, 221; Chap., Fl. S. St. 201; Mac., Fl. Can. I, 544; Webb., Appx. Neb. 43; Coult., Fl. Tex. 195.

North America: Ont. to N. Y.; W. to Minn., Ohio, Mo., Neb., Ark. and Tex.

Minn. valley: Throughout; prairies and borders of woods.

HERB.: *Sandberg* 284, Red Wing; ?*Bailey* 507, Agate bay; *Taylor* 1183, Glenwood.

Aster patens AIT. Hort. Kew. III, 201 (1789).*A. amplexicaulis* MICHX. Fl. N. Am. II, 114 (1803).*A. undulatus* ELL. Sk. II, 361 (1824).*A. patentissimus* LINDL. DC. Prodr. V, 232 (1836).

Wats. and Coult., Gray's Man. 6 ed. 258; Britt., Fl. N. J. 137; Webb., Fl. Neb. 148; Mac., Fl. Can. I, 221; Chap., Fl. S. St. 200; Cov., Fl. Ark. 192; Gray, Syn. Fl. I, 2, 180; Coult., Fl. Tex. 195.

North America: N. Br., Q., Ont. to Mass., N. J., Va. and Fla.; W. to Minn., Neb. and Ark.

Minn. valley: Reported from N. edge and forest district to Blue Earth Co.; rare; dry places and banks of streams.

HERB.: *Sandberg* 281, Red Wing.

Aster sericeus VENT. Hort. Cels. 33 (1800).*A. argenteus* MICHX. Fl. N. Am. II, 111 (1803).

Wats. and Coult., Gray's Man. 6 ed. 257; Webb., Fl. Neb. 148; Upham, Fl. Minn. 71; Mac., Fl. Can. I, 220; Chap., Fl. S. St. 199; Cov., Fl. Ark. 192; Gray, Syn. Fl. I, 2, 179; Coult., Fl. Tex. 194.

North America: S. Man., Minn., Neb. and Wisc.; S. to Ky., N. Car., Tenn. and Tex.

Minn. valley: Throughout; common; prairies, dry hillsides and banks.

HERB.: *Sheldon* 735, Sleepy Eye; *Taylor* 742, Glenwood; *Sheldon* 1457, Pipestone; *Taylor* 1097, Glenwood; *Sheldon* 1323, Lake Benton; *Leonard* 24, Minnehaha Park; *Kassube* 125, Minneapolis; *Sandberg* 280, Red Wing; *Herb. Wickersheim* 62, Idlewild, Lincoln Co.; *Herb. Moyer* 112, Montevideo.

Aster novae-angliae LINN. Spec. 875 (1753).*A. amplexicaulis* LAM. Enc. Meth. I, 304 (1783).*A. spurius* WILLD. Spec. III, 2032 (1803).

Wats. and Coult., Gray's Man. 6 ed. 257; Britt., Fl. N. J. 139; Webb., Fl. Neb. 148; Coult., Fl. Colo. 159; Chap., Fl. S. St. 205; Mac., Fl. Can. I, 226, 545; Upham, Fl. Minn. 73; Cov., Fl. Ark. 192; Engl. Hoffmann, Nat. Pflanz. IV, 5, 163; Gray, Syn. Fl. I, 2, 178.

North America: Man., Georgian Bay and Q. to Minn., Dak., Neb., Colo., Ark., Tenn. and S. Car.

Minn. valley: Throughout; abundant; moist woodland, river banks and around lake shores.

HERB.: *Taylor* 955, Glenwood; *Sheldon* 1503, Lake Benton; *Sandberg* 291, Red Wing; *Herb. Sheld.* 1816, Minneapolis; *Herb. Wickersheim* 68, Ash lake, Lincoln Co.

Aster oblongifolius NUTT. Gen. II, 156 (1818).*A. biennis* TORR. Ann. Lyc. N. Y. II, 122 (1834).*A. multiceps* LINDL. DC. Prodr. V, 237 (1836).

Wats. and Coult., Gray's Man. 6 ed. 257; Webb., Fl. Neb. 148; Coult.,

Fl. Colo. 160; Upham, Fl. Minn. 73; Cov., Fl. Ark. 192; Gray, Syn. Fl. I, 2, 178; Coult., Fl. Tex. 194.

North America: Penn. and Va. to Minn., Neb., Dak., Colo., Kan., Ark. and Tex.

Minn. valley: Throughout, but local; more abundant W. than E.; banks and hillsides.

HERB.: *Holzinger* 111, Winona Co.; *Sheldon* 1444½, Pipestone City; *Sheldon* 1324, Lake Benton; *Herb. Wickersheim* 66, Idlewild, Lincoln Co.; 67, Ash lake, Lincoln Co.; *Herb. Moyer* 115, Montevideo.

Aster macrophyllus LINN. Spec. 2 ed. 1232 (1762).

Eurybia macrophylla CASS. Dict. XXXVII, 487 (1826).

E. jussiei CASS. Dict. XXXVII, 487 (1826).

Biotia schroeberi, *latifolia*, *glomerata*, *macrophylla* DC. Prodr. V, 265 (1836).

Wats. and Coult., Gray's Man. 6 ed. 256; Britt., Fl. N. J. 136; Upham, Fl. Minn. 70; Webb., Fl. Neb. 148; Mac., Fl. Can. I, 219; Chap., Fl. S. St. 198; Engl. Hoffmann, Nat. Pflanz. IV, 5, 162; Gray, Syn. Fl. I, 2, 175.

North America: N. S., N. Br., Q., Ont. to S. Man.; S. to N. Eng., N. J. and Ga.; W. to Minn., Neb. and Kan.

Minn. valley: Reported from N. E. district and probably in Leaf hill district; woods and along streams.

HERB.: *Bailey* 297, Vermilion Lake; *Bailey* 462, Agate bay; *Bailey* 503, Agate bay.

Aster asteroides (LINN.).

Conyza asteroides LINN. Spec. 861 (1753).

Aster conyzoides WILLD. Spec. III, 2043 (1803).

A. marilandicus MICHX. Fl. N. Am. II, 108 (1803).

Sericocarpus conyzoides NEES, Ast. 148 (1832).

S. asteroides B. S. P. Cat. N. Y. (1888).

Wats. and Coult., Gray's Man. 6 ed. 254; Chap., Fl. S. St. 197; Gray, Syn. Fl. I, 2, 171; Britt., Fl. N. J. 146.

North America: Maine to Ga. and Fla.; W. to Ohio and Minn.

Minn. valley: Reported from New Ulm; S. central region; local; dry soil and sunny banks.

Aster divaricatus LINN. Spec. 873 (1753).

A. corymbosus AIT. Hort. Kew. III, 207 (1789).

A. cordifolius MICHX. Fl. N. Am. II, 114 (1803).

Eurybia corymbosa CASS. Dict. XXXVII, 487 (1826).

Biotia corymbosa DC. Prodr. V, 265 (1836).

Wats. and Coult., Gray's Man. 6 ed. 255; Britt., Fl. N. J. 136; Mac., Fl. Can. I, 219; Upham, Fl. Minn. 70; Chap., Fl. S. St. 198; Engl. Hoffmann, Nat. Pflanz. IV, 5, 162; Gray, Syn. Fl. I, 2, 174.

North America: W. Q. to S. Man.; S. to N. J. and Ga.; W. to Minn. and Iowa.

Minn. valley: Reported from N. E. district; rare; wooded banks and in glades.

ERIGERON LINN. Gen. 653 (1737).

Trimorphoea CASS. Bull. Phil. (1817).

Leptostelma DON, Sweet. Brit. Fl. Gard. 2, 38 (1829).

Stenactis NEES, Gen. Ast. 273 (1832).

Woodvillea DC. Prodr. V, 318 (1836).

Phalacrolooma CASS. Dict. XXXIX, 404 (1834).

Polyactis and **Polyactidium** LESS. Syn. Comp. 188 (1832).

Conyzella RUPR. Sert. Tsch. 51 (—).

Heterochaeta DC. Prodr. V, 282 (1836).

Gusmania REMY, C. Gay, Fl. Chil. IV, 12 (1845).

Astradelphus REMY, Ann. Sci. Nat. ser. 3, XII, 185 (1849).

Terranea COLLA, Mem. Acad. Tur. XXXVIII, 11 (1835).

Vittadinia A. RICH. Fl. N. Zeal. 250 (1834).

Microgyne LESS. Syn. 190 (1832).

Eurybiopsis DC. Prodr. V, 260 (1836).

Tetramolopium NEES, Ast. 202 (1832).

Brachyactis LED. Fl. Ross. II, 495 (1846).

Lachnophyllum BUNGE, Rel. Lehm. 151 (1848).

Nidorella CASS. Dict. XXXVII, 469 (1834).

Conyza LINN. Gen. 950 (1737) *part.*

Eschenbachia MOENCH, Meth. 573 (1794).

Fimbrillaria CASS. Dict. XVII, 54 (1826).

Dimorphanthus CASS. l. c. XIII, 254 (1826).

Laennecia CASS. l. c. XXI, 91 (1834).

Achaetogeron A. GRAY, Pl. Fendl. 72 (1849).

Baillon, *Hist. Pl.* VIII, 143; Benth. and Hook., *Gen. Pl.* II, 279, 280, 282; Durand, *Ind. Gen. Phan.* 197; Engler and Prantl, *Nat. Pflanz.* IV, 5, 164 (Hoffmann).

Living species: $200 \pm$; 100 (B. and H.); 110 (Durand); 150 (Hoffmann); about half of these are in N. America, most of the remainder are S. American. The rest are S. African, Australian, Oceanic and old world. It is not clear what should be the limits of this genus. North America, $80 \pm$; Canada, 30; Rocky mts., 35; S. Sts., 10; E. Sts., 10; California, 25; Pl. King, 19–20; Pl. Wheel., 20–21; W. Tex., 11.

Erigeron philadelphicus LINN. Spec. 863 (1753).

E. purpureum AIT. Hort. Kew. III, 186 (1789).

E. pulchellus var. *a.* HOOK. Fl. Bor.-Am. II, 19 (1840).

E. purpureus HOOK. Fl. Bor.-Am. II, 19 (1840).

Wats. and Coult., *Gray's Man.* 6 ed. 266; Britt., *Fl. N. J.* 140; Webb., *Fl. Neb.* 148; Chap., *Fl. S. St.* 206; Upham, *Fl. Minn.* 74; Mac., *Fl. Can.* I, 233; Coult., *Fl. Colo.* 173; Wats., *Fl. Calif.* II, 331; Cov., *Fl. Ark.* 192; Gray, *Syn. Fl.* I, 2, 217; Coult., *Fl. Tex.* 198.

North America: Calif. and Oregon across continent to Fla. and Tex. and N. to Arctic circle.

Minn. valley: Throughout; moist places and in edges of woodland.

HERB.: *Ballard* 35 Carver; *Taylor* 137, Janesville; *Taylor* 795, Glenwood; *Sheldon* 1395, Lake Benton; *Taylor* 646, Minnesota lake; *Taylor* 24, Elysian; *Taylor* 346, Janesville; *Sheldon* 896, Sleepy Eye; *Sheldon* 292, Madison Lake; *Sheldon* 526, Waseca; *Sandberg* 296, Chisago Co.; *Kassube* 128, Minneapolis; *Herrick* 147, Minneapolis; *Arthur* 65, Vermilion lake; *Bailey* 285, Vermilion lake; *Herb. Sheld.* 1807, Ramsey Co.; 1795, Ft. Snelling; *Herb. Wickersheim* 70, Idlewild; *Herb. Moyer* 117, Montevideo; 118, Montevideo.

***Erigeron pulchellus* MICHX.** Fl. N. Am. II, 124 (1803).

E. bellidifolius MUHL. Willd. Spec. III, 1958 (1803).

Wats. and Coult., Gray's Man. 6 ed. 266; Britt., Fl. N. J. 140; Chap., Fl. S. St. 206; Mac., Fl. Can. I, 233, 547; Upham, Fl. Minn. 74; Wats., King Exp. 151; Cov., Fl. Ark. 192; Gray, Syn. Fl. I, 2, 216.

North America: N. S. to N. J., Tenn. and S. Car.; W. to Q., Ont., Man., Minn. and La.

Minn. valley: Forest district; infrequent; banks and edges of low woodland.

HERB.: *Kassube* 127, Minneapolis; *Herrick* 146, Minneapolis; *Sandberg* 294, Washington Co.; *Sandberg* 295, Chisago lake.

***Erigeron glabellus* NUTT.** Gen. II, 147 (1818).

E. asper NUTT. Gen. II, 147 (1818).

E. pulchellus HOOK. Fl. Bor.-Am. II, 19 (1840) *in part.*

Wats. and Coult., Gray's Man. 6 ed. 265; Upham, Fl. Minn. 74; Mac., Fl. Can. I, 232; Coult., Fl. Colo. 169; Wats., King Exp. 150; Gray, Syn. Fl. I, 2, 209.

North America: Man. and Saskatchewan to Rocky mts. and Alaska; 64° N. lat.; S. to Wisc., Minn., Dak., Mont., Colo. and S. Utah.

Minn. valley: Reported from S. E. district; rare or doubtful; fields and dry prairies

***Erigeron ramosus* (WALT.) B. S. P.** Cat. N. Y. (1888).

Doronicum ramosum WALT. Fl. Car. 205 (1788).

Erigeron strigosus MUHL. Willd. Spec. III, 1956 (1803).

E. nervosum PURSH, Fl. Am. II, 148 (1814).

E. ambiguus NUTT. Gen. II, 147 (1818).

E. philadelphicus BART. Mat. Med. 20 (1820).

E. integrifolius BIGEL, Fl. Bost. ed. 2, 302 (1824).

Phalacrolooma obtusifolium CASS. Dict. XXXIX, 405 (1826).

Stenactis ambigua DC. Prodr. V, 299 (1836).

E. strigosus var. *discoideus* ROBBINS, Gray's Man. 5 ed. 237 (1867).

Wats. and Coult., Gray's Man. 6 ed. 265; Britt., Fl. N. J. 140; Mac.,

Fl. Can. I, 234; Webb., Fl. Neb. 148; Chap., Fl. S. St. 200; Upham, Fl. Minn. 74; Wats., Fl. Calif. II, 331; Coult., Fl. Colo. 173; Cov., Fl. Ark. 192; Engl. Hoffmann, Nat. Pflanz. IV. 5, 164; Gray, Syn. Fl. I, 2, 219; Coult., Fl. Tex. 199.

North America: N. S. to Man., Saskatchewan and N. W. T. to 49° N. lat.; S. to N. Eng., N. J. and Tex.; W. to Minn., Dak., Mont., Oregon, California, Neb., Ark.

Minn. valley: Throughout; waste places and fields.

HERB.: *Ballard* 464, Prior's lake, Scott Co.; *Ballard* 336, Belle Plaine; *Sheldon* 1481, Pipestone City; *Sheldon* 649, Waseca; *Sheldon* 750, Sleepy Eye; *Taylor* 354, Janesville; *Taylor* 705, Glenwood; *Sheldon* 530, Waseca; *Sheldon* 1124, Springfield; *Winchell* 9, Minneapolis; *Oestlund* 90, Minneapolis. *Kasube* 129, Minneapolis; *Holzinger* 113, Winona Co.; *Bailey* 161, Vermilion lake; *Sandberg* 298, Cannon Falls; *Holzinger* 114, Winona Co.; *Herb. Sheld.* 2195, Minneapolis; *Herb. Sheld.* 1814, Cedar lake; *Herb. Moyer* 120, Montevideo; 121, Montevideo.

***Erigeron annuus* (LINN.) PERS.** Syn. II, 431 (1807).

Aster annuus LINN. Hort. Cliff. and Spec. 875 (1753).

Pulicaria annua GAERTN. Fruct. II, 462 (1791).

Erigeron heterophyllus MUHL. Willd. Spec. III, 1956 (1803).

Diplopappus dubius CASS. Bull. Philom. (1817-1818).

Erigeron strigosus BIGEL. Fl. Bost. 2 ed. 302 (1824).

Phalacrolooma acutifolium CASS. Dict. XXXIX, 405 (1826).

Stenactis dubia CASS. Dict. XXXVII, 485 (1826).

Stenactis annua and *strigosa* DC. Prodr. V, 299 (1836).

Wats. and Coult., Gray's Man. 6 ed. 265; Britt., Fl. N. J. 140; Upham, Fl. Minn. 74; Mac., Fl. Can. I, 234; Webb., Fl. Neb. 147; Wats., Fl. Calif. II, 331; Cov., Fl. Ark. 192; Engl. Hoffmann, Nat. Pflanz. IV, 5, 164; Gray, Syn. Fl. I, 2, 219.

Introduced in Germany.

North America: N. S., N. Br. to W. Ont.; S. to N. Eng., N. J. and Va.; W. to Mont., Oregon, California, Neb. and Ark.

Minn. valley: Reported from S. E. edge and N. E. district; absent elsewhere; waste places and roadsides.

HERB.: *Sandberg* 297, Goodhue Co.

***Erigeron divaricatus* MICHX.** Fl. N. Am. II, 123 (1803).

Wats. and Coult., Gray's Man. 6 ed. 265; Webb., Fl. Neb. 147; Coult., Fl. Colo. 174; Upham, Fl. Minn. 74; Cov., Fl. Ark. 192; Gray, Syn. Fl. I, 2, 221; Coult., Fl. Tex. 198.

North America: Colo. to Minn., Neb., Ind. and Tex.

Minn. valley: Reported from S. E. and S. edges; rare; doubtful; localities of *E. canadensis* Linn.

***Erigeron canadensis* LINN.** Spec. 863 (1753).

E. paniculatus LAM. Fl. Fr. (1778).

Senecio ciliatus WALT. Fl. Car. 208 (1788).

Erigeron pusillus NUTT. Gen. II, 138 (1818).

E. strictum DC. Prodr. V, 289 (1836).

Wats. and Coult., Gray's Man. 6 ed. 265; Britt., Fl. N. J. 140; Webb., Fl. Neb. 147; Chap., Fl. S. St. 206; Upham, Fl. Minn. 74; Mac., Fl. Can. I, 235; Coult., Fl. Colo. 174; Wats., Fl. Calif. II, 331; Hook., Fl. Gt. Brit. 205; Gris. Fl. W. I.; Forbes and Hems., Fl. Sin. 418; Led., Fl. Ross. II, 487; Herd., Fl. Eur. Russ. 66; Roth., Wheel. Exp. 152; Wats., King Exp. 147; Cov., Fl. Ark. 192; Engl. Hoffmann, Nat. Pflanz. IV, 5, 164; Gray, Syn. Fl. I, 2, 221; Hart., Fl. Scand. I, 554; Coult., Fl. Tex. 198.

Europe to Caucasus; Siberia and China; intro, in S. Africa; Malay archipelago?

North America: Throughout continent to Jamaica.

Minn. valley: Throughout; waste places, roadsides and railway embankments.

HERB.: *Taylor* 801, Glenwood; *Sheldon* 1591, Lake Benton; *Ballard* 758, Waconia; *Bailey* 271, St. Louis river; *Oestlund* 89, Minneapolis; *Roberts* 60, Grand Marais; *Herrick* 145, Minneapolis; *Sandberg* 293, Goodhue Co.

ANTENNARIA GAERTN. Fruct. II, 410 (1792).

Baillon, *Hist. Pl.* VIII, 169; Benth. and Hook., *Gen. Pl.* II, 301; Durand, *Ind. Gen. Phan.* 200; Engler and Prantl, *Nat. Pflanz.* IV, 5, 186.

Living species: 15–20; Alpine regions, Europe, Asia, N. and S. America and Australia; extra-tropical. Russia, 5; Europe, 4; Russian Europe, 3; North America, 12; Canada, 7; Rocky mts., 7; E. Sts., 1; California, 7; S. Sts., 1; Pl. King, 4; Pl. Wheel., 2; W. Tex., 1.

***Antennaria plantaginifolia* (LINN.) HOOK.** Fl. Bor.-Amer. I, 329 (1833).

Gnaphalium plantaginifolium LINN. Spec. 882 (1753).

G. plantagineum MURR. Syst. 748 (1774).

G. dioicum var. *plantaginifolium* MICHX. Fl. N. Am. II, 128 (1803).

Antennaria plantaginea DC. Prodr. VI, 269 (1837).

Wats. and Coult., Gray's Man. 6 ed. 267; Britt., Fl. N. J. 141; Webb., Fl. Neb. 147; Upham, Fl. Minn. 86; Mac., Fl. Can. I, 235; Chap., Fl. S. St. 243; Coult., Fl. Colo. 177; Brew. and Wats., Fl. Calif. I, 338; Cov., Fl. Ark. 193; Gray, Syn. Fl. I, 2, 233; Coult., Fl. Tex. 202.

North America: Anticosti, N. S., N. Br. to Pac.; N. to Slave lake and Hudson Bay; S. to Oregon and N. Mex.; E. to Atl. coast and Fla.

Minn. valley: Throughout; grassy knolls or plains; openings in forest; prairies.

HERB.: *Sheldon* 210, Lake Washington, Blue Earth Co.; *Sheldon* 627, Wilton, Waseca Co.; *Sheldon* 919, Sleepy Eye; *Taylor* 218, Janesville; *Taylor* 9, Elysian; *Sheldon* 1589, Lake

Benton; *Herrick* 171, Minneapolis; *Leiberg* 42, Blue Earth Co.; *Kassube* 141, Minneapolis; *Bailey* 218, Vermilion lake; *Sandberg* 343, Red Wing; *Holzinger* 132, Winona Co.; *Holzinger* 133, Winona Co.; *Herb. Sheld.* 1716, Ramsey Co.; 1810, Minneapolis; *Herb. Wickersheim* 82, Idlewild, Lincoln Co.; *Herb. Moyer* 150, Montevideo.

ANAPHALIS DC. Prodr. VI, 271 (1837).

Baillon, *Hist. Pl.* VIII, 171; Engler and Prantl, *Nat. Pflanz.* IV, 5, 186; Durand, *Ind. Gen. Phan.* 200; Benth. and Hook., *Gen. Pl.* II, 303.

Living species: 30; tropical and temperate Asia; 1 sp. in N. hemisphere throughout, and in N. America (United States). N. America, 1.

Anaphalis margaritacea (LINN.) B. and H. Gen. Pl. II, 303 (1873).

Gnaphalium margaritacea LINN. Spec. 850 (1753).

Antennaria margaritacea R. BR. Trans. Linn. Soc. XII (1817).

Wats. and Coult., Gray's Man. 6 ed. 268; Britt., Fl. N. J. 141; Mac., Fl. Can. I, 237; Upham, Fl. Minn. 86; Chap., Fl. S. St. 243; Coult., Fl. Colo. 177; Brew. and Wats., Fl. Calif. I, 341; Forbes and Hems., Fl. Sin. 425; Led., Fl. Ross. II, 613; Hook., Fl. Gt. Brit. 209; Miyabe, Fl. Kur. 241; Wats., King Exp. 185; Engl. Hoffmann, Nat. Pflanz. IV, 5, 186; Gray, Syn. Fl. I, 2, 233.

N. Asia to Amur., Kamtk., Japan, Saghalin and Kuriles; in var. to Ceylon. Intro.? in Europe.

North America: Newf., Anticosti, N. S. and N. Br. to Alaska and Pac.; S. to Oregon and Mid. Calif.; E. to Atl. coast, N. Eng. and Del.; S. to mts. of N. Car.

Minn. valley: Forest district; local and rare; dry hills, thickets, woods and knolls.

HERB.: *Roberts* 69, Beaver bay; *Leiberg* 41, Blue Earth Co.; *Bailey* 160, Vermilion lake; *Sandberg* 342, Chisago Co.; *MacM.* and *Sheld.* 39, Brainerd.

GNAPHALIUM LINN. GEN. 645 (1737), emend. Benth. l. c. (1873).

Gamochaeta WEDD. Chlor. And. I, 151 (1855).

Euchiton CASS. Dict. LVI, 215 (1834).

Omalotheca CASS. l. c. 218 (1834).

Belloa REMY, Gay Fl. Chile III, 336 (1845).

Lucilia CASS. Bull. Philom. (1817).

Merope WEDD. Chlor. And. I, 160 (1855).

Baillon, *Hist. Pl.* VIII, 168; Benth. and Hook., *Gen. Pl.* II, 305; Durand, *Ind. Gen. Phan.* 200; Engler and Prantl, *Nat. Pflanz.* IV, 5, 187 (Hoffmann).

Living species: 120; cosmopolitan. Europe, 6; Rus-

sia, 6; N. America, 15; Canada, 10-11; S. Sts., 2; E. Sts., 5; Rocky mts., 4; California, 6; Pl. Wheel., 3; Pl. King, 3; W. Tex., 7.

Gnaphalium uliginosum LINN. Fl. Dan. 859 (1757).

Wats. and Coult., Gray's Man. 6 ed. 268; Britt., Fl. N. J. 142; Mac., Fl. Can. I, 238; Upham, Fl. Minn. 86; Forbes and Hems., Fl. Sin. 428; Nym., Fl. Eur.: Led., Fl. Ross. II, 609; Hook., Fl. Gt. Brit. 208; Herd., Fl. Eur. Russ. 70; Wats., King Exp. 185; Engl. Hoffmann, Nat. Pflanz. IV, 5, 187; Gray, Syn. Fl. I, 2, 235; Hart., Fl. Scand. I, 12.

Northern Europe to Sicily and Sardinia; N. Asia to Amurland and China.

North America: Greenland and N. S. to Saskatchewan, Oregon and Brit. Col.; S. to N. Eng. and N. J., and adventive further south; S. to Minn. and Dak.

Minn. valley: N. E. and N. W. districts at higher levels; woods and sandy places; rare.

HERB.: *Sheldon 1610*, St. Anthony Park.

Gnaphalium decurrens IVES, Am. Jour. Sci. I, 380 (1820).

Wats. and Coult., Gray's Man. 6 ed. 268; Britt., Fl. N. J. 142; Coult., Fl. Colo. 178; Mac., Fl. Can. I, 237; Upham, Fl. Minn. 86; Cov., Fl. Ark. 193; Gray, Syn. Fl. I, 2, 235; Coult., Fl. Tex. 203.

North America: N. S., N. Br., Q., Ont. to Man., Brit. Col. and Washington; S. to N. Eng. and N. J.; W. to Colo., Tex. and Mex.

Minn. valley: Reported from S. central district; rare or doubtful; woods and hillsides in sandy soil.

Gnaphalium obtusifolium LINN. Spec. 851 (1753).

G. polycephalum MICHX. Fl. N. Am. II, 127 (1803).

G. conoideum LAM. Enc. Meth. II, 755 (1786).

Wats. and Coult., Gray's Man., 6 ed. 268; Britt., Fl. N. J. 142; Mac., Fl. Can. I, 238; Upham, Fl. Minn. 86; Chap., Fl. S. St. 243; Gray, Syn. Fl. I, 2, 234; Coult., Fl. Tex. 203.

North America: N. S., Q., Ont. to S. Man.; S. to Minn., Mo., and E. to Atl. and Fla.; Tex. and Mex.

Minn. valley: Forest district to Blue Earth Co.; open woods or thickets, sandy soil; infrequent.

HERB.: *Holtz 3*, Minneapolis; *Sandberg 341*, Goodhue Co.

ADENOCaulon HOOK. Bot. Misc. I, 19 (1849).

Baillon, *Hist. Pl.* VIII, 239; Benth. and Hook., *Gen. Pl.* II, 344; Durand, *Ind. Gen. Phan.* 206; Engler and Prantl, *Nat. Pflanz.* IV, 5, 206.

Living species: 2; 1, N. America, Japan and Himalayas; 1, Chile to Magellan.

Adenocaulon bicolor HOOK. Bot. Misc. I, 119 (1849).

Wats. and Coult., Gray's Man. 6 ed. 269; Upham, Fl. Minn. 70; Mac., Fl. Can. I, 239; Engl. Hoffmann, Nat. Pflanz. IV, 5, 206; Gray, Syn. Fl. I, 2, 237.

Himalayas to Japan.

North America: N. of L. Superior to lat. 52° N.; W. to Rockies, Cascade range, Brit. Col., Vancouver; S. to Calif. and C. Minn.

Minn. valley: Reported from N. edge; rare; moist or deep woodland.

HERB.: *Bailey 296*, St. Louis river.

POLYMNIA LINN. Diss. Chen. 1181 (1751).

Alymnia NECK. Elem. I, 31 (1790).

Polymniastrum LAM. Ill. 712 (1793).

Baillon, *Hist. Pl.* VIII, 234 (*sub Silphium*); Benth. and Hook., *Gen. Pl.* II, 346; Durand, *Ind. Gen. Phan.* 206; Engler and Prantl, *Nat. Pflanz.* IV, 5, 217 (Hoffmann).

Living species: 10–12; Buenos Ayres to Brit. Col. Canada, 1; E. Sts., 2; S. Sts., 2; W. Tex. 1.

Polymnia canadensis LINN. Amoen. III, 15 (1756).

P. canadensis var. *discoidea* GRAY, Man. 3 ed. 248 (1857).

Wats. and Coult., Gray's Man. 6 ed. 269; Upham, Fl. Minn. 78; Chap., Fl. S. St. 219; Mac., Fl. Can. I, 239; Cov., Fl. Ark. 193; Gray, Syn. Fl. I, 2, 238.

North America: Ont. and Conn. to mts. of N. Car.; W. to Minn., Kan., Mo. and Ark.

Minn. valley: S. E. district; rare; ravines, woods and damp edges of thickets.

HERB.: *Sandberg 309*, Red Wing; *Holzinger 120*, Winona Co.; *Sandberg 310*, Red Wing; *Holzinger 121*, Winona Co.; and in variety *radiata* Gray, *Sheldon 653*, Waseca.

SILPHIUM LINN. Gen. Corr. 981 (1737).

Baillon, *Hist. Pl.* VIII, 234 (incl. *Philoglossa* DC., *Berlandiera* DC., *Engelmannia* T. and G., *Schizoptera* Turcz., *Polymnia* Linn.); Benth. and Hook., *Gen. Pl.* II, 350; Durand, *Ind. Gen. Phan.* 207; Engler and Prantl, *Nat. Pflanz.* IV, 5, 218 (Hoffmann).

Living species: 12–13; N. America. E. Sts., 6–7; S. Sts., 8–9; Rocky mts., 1; Canada, 2; W. Tex., 6.

Silphium perfoliatum LINN. Spec. 2 ed. 1301 (1762).

S. connatum LINN. Mant. 574 (1767).

S. tetragonum and *scabrum* MOENCH, Meth. 606 (1794).

S. conjunctum WILLD. Enum. 633 (1809).

S. hornemanni SCHRAD. Hort. Gött. (1809).

S. erythrocaulon BERNH. Spreng. Syst. III, 630 (1826).

Wats. and Coult., Gray's Man. 6 ed. 271; Webb., Fl. Neb. 147; Upham, Fl. Minn. 78; Chap., Fl. S. St. 221; Mac., Fl. Can. I, 239, 549; Cov., Fl. Ark. 193; Engl. Hoffmann, Nat. Pflanz. IV, 5, 218; Gray, Syn. Fl. I, 2, 240.

North America: Detroit river to Minn. and Neb.; S. to Ark., mts. of Ga. and La.

Minn. valley: Throughout; gullies and ravines, edges of woods and thickets; wet places.

HERB.: *Sheldon* 1298, Lake Benton; *Taylor* 723, Minnesota lake; *Ballard* 391, Jordan, Scott Co.; *Ballard* 772, Swan lake, Carver Co.; *Taylor* 702, Minnesota lake; *Sheldon* 901, Sleepy Eye; *Sheldon* 374, Lake Ballentyne, Blue Earth Co.; *Sheldon* 768, Sleepy Eye; *Kassube* 135, Minneapolis; *Herrick* 155, Minneapolis; *Sandberg* 312, Goodhue Co.; *Herb. Moyer* 131, Minnesota valley, near Montevideo.

Silphium integrifolium MICHX. Fl. N. Am. II, 146 (1803).

S. laevigatum PURSH, Fl. Am. II (1814).

S. speciosum NUTT. Trans. Am. Phil. Soc. VII, 341 (1841).

S. integrifolium var. *laeve* T. and G. Fl. II, 279 (1841).

Wats. and Coult., Gray's Man. 6 ed. 271; Webb., Fl. Neb. 147; Upham, Fl. Minn. 78; Cov., Fl. Ark. 193; Gray, Syn. Fl. I, 2, 240; Coult., Fl. Tex. 205.

North America: Mich. to Minn. and Neb.; S. to Mo., Ark., Tex. and W. Ga.

Minn. valley: Reported from S. E. district; rare or local; prairies and hillsides or embankments.

Silphium terebinthinaceum JACQ. Hort. Vindob. I, 43 (1762).

Wats. and Coult., Gray's Man. 6 ed. 270; Mac., Fl. Can. I, 239; Cov., Fl. Ark. 193; Engl. Hoffmann, Nat. Pflanz. IV, 5, 218; Gray, Syn. Fl. I, 2, 242.

North America: Ohio, Mich., Wisc., Minn. and Dak. to Neb., Tex., Ark., Ga., La.

Minn. valley: S. central district; rare; prairies and banks.

Silphium laciniatum LINN. Spec. 919 (1753).

S. spicatum POIR. Suppl. V, 157 (1811).

S. gummiferum ELL. Sk. II, 426 (1824).

Wats. and Coult., Gray's Man. 6 ed. 270; Webb., Fl. Neb. 147; Upham, Fl. Minn. 78; Coult., Fl. Colo. 179; Chap., Fl. S. St. 220; Cov., Fl. Ark. 193; Engl. Hoffmann, Nat. Pflanz. IV, 5, 218; Gray, Syn. Fl. I, 2, 242; Coult., Fl. Tex. 205.

North America: Minn., Wisc. and Dak. to Neb., Colo., Ark. and Tex.; E. to Alabama.

Minn. valley: S. central and S. W. districts; E. to Waseca; banks, hillsides and prairies.

HERB.: *Sheldon* 637, Waseca; *Taylor* 473, Janesville; *Taylor* 683, Minnesota lake; *Sandberg* 311, Cannon Falls.

PARTHENIUM LINN. Gen. 675 (1737).

Villanova ORT. Dec. 47 (1800).

Argyrochaeta Cav. Ic. IV, 54 (1797).

Bolophyta NUTT. Trans. Phil. Soc. 2, VII, 347 (1841).

Partheniastrum NISSOL. Act. Par. (1711).

Hysterophorus VAILL. Act. Par. 335 (1720).

Trichospermum P. BEAUV. ex DC. Prodr. V (1836).

Aiolothea DC. Prodr. V, 508 (1836).

Parthenice T. and G. Pl. Wright. II, 85 (1845).

Baillon, *Hist. Pl.* VIII, 233; Benth. and Hook., *Gen. Pl.* II, 351, 352; Durand, *Ind. Gen. Phan.* 207; Engler and Prantl, *Nat. Pflanz.* IV, 5, 219 (Hoffmann).

Living species: 11-12; N. America, Mexico, C. America and W. Indies; 1 also in S. America and introduced in Mauritius. U. S., 5; E. Sts., 1; S. Sts., 2; Pl. Wheel., 1; W. Tex., 5.

Parthenium integrifolium LINN. Spec. 988 (1753).

Wats. and Coult., Gray's Man. 6 ed. 272; Chap., *Fl. S. St.* 222; Upham, *Fl. Minn.* 78; Cov., *Fl. Ark.* 194; Gray, *Syn. Fl. I*, 2, 245; Coult., *Fl. Tex.* 208.

North America: Ind. to Alabama; W. to Minn., Ills. and Texas.

Minn. valley: Reported from the S. E. district; rare or local; dry places in edges of woods or thickets.

CYCLACHAENA FRESEN. Ind. Hort. Frank. (1836).

Baillon, *Hist. Pl.* VIII, 287 (*sub Iva*); Benth. and Hook. *Gen. Pl.* II, 353; Engler and Prantl, *Nat. Pflanz.* IV, 5, 221 (Hoffmann); Durand, *Ind. Gen. Phan.* 207.

Living species: 3, W. United States. (Possibly better combined as a separate section with *Iva* Linn.)

Cyclachaena xanthiifolia (NUTT.) FRESEN. Ind. Sem. Hort. Frank. (1836).

Iva xanthiifolia NUTT. Gen. II, 185 (1818).

Euphrosyne xanthiifolia GRAY, Pl. Wright. II, 85 (1852).

Wats. and Coult., Gray's Man. 6 ed. 273; Mac., *Fl. Can.* I, 240; Webb., *Fl. Neb.* 147; Upham, *Fl. Minn.* 78; Coult., *Fl. Colo.* 179; Engl. Hoffmann, *Nat. Pflanz.* IV, 5, 221; Gray, *Syn. Fl. I*, 2, 246.

North America: Saskatchewan to Idaho and Washington; S. to Minn., Neb. and N. Mex.

Minn. valley: Throughout; especially S. central and S. W. districts; roadsides, banks and waste places.

HERB.. *Sandberg* 131, Goodhue Co.; *Herb. Moyer* 132, Montevideo.

AMBROSIA LINN. Gen. 718 (1737).

Franseria CAV. Ic. II, 78 (1793).

Hemiambrisia DELP. Stud. Art. 57 (1871).

Hemixanthidium DELP. l. c. 62 (1871).

Xanthidium DELP. l. c. 62 (1871).

Hymenoclea T. and G. Pl. Fendl. 79 (1849).

Baillon, *Hist. Pl.* VIII, 286; Benth. and Hook., *Gen. Pl.* II, 354; Durand, *Ind. Gen. Phan.* 207; Engler and Prantl, *Nat. Pflanz.* IV, 5, 221 (Hoffmann).

Living species: $35 \pm$; Mediterranean region, Africa, N. and C. America, Sandwich Isls. U. S., 24; Canada, 6; S. Sts., 4; California, 13; Rocky mts., 7; W. Tex., 5.

Ambrosia psilostachya DC. Prodr, V, 526 (1836).

A. peruviana DC. Prodr, V, 526 (1836).

A. coronopifolia T. and G. Fl. II, 291 (1841).

Wats. and Coult., Gray's Man. 6 ed. 273; Coult., Fl. Colo. 181; Webb., Fl. Neb. 147; Mac., Fl. Can. I, 240; Upham, Fl. Minn. 79; Brew. and Wats., Fl. Calif. I, 344; Griseb., Fl. W. I.; Wats., King Exp. 165; Roth., Wheel. Exp. 158; Cov., Fl. Ark. 194; Gray, Syn. Fl. I, 2, 250; Coult., Fl. Tex. 210.

North America: 49° N. in N. W. T. and Saskatchewan to Minn., Wisc., Ill., Neb., Tex. and Mex. to Calif., Nev. and Arizona.

Minn. valley: Throughout; habitat as in *A. artemisiaefolia* Linn.

HERB.: *Taylor 1146*, Starbuck, Pope Co.; *Sheldon 1522*, Lake Benton; *Oestlund 95*, Hennepin Co.; *Sandberg 316*, Red Wing.

Ambrosia artemisiaefolia LINN. Spec. 987 (1753).

A. elatior LINN. Spec. 988 (1753).

Iva monophylla WALT. Fl. Car. 233 (1788).

Ambrosia absinthifolia MICHX. Fl. N. Am. II, 183 (1803).

A. paniculata MICHX. Fl. N. Am. II, 183 (1803).

A. heterophylla MUHL. Willd. Spec. IV, 378 (1805).

Wats. and Coult., Gray's Man. 6 ed. 273; Britt., Fl. N. J. 143; Webb., Fl. Neb. 147; Upham, Fl. Minn. 79; Mac., Fl. Can. I, 240; Chap., Fl. S. St. 223; Coult., Fl. Colo. 180; Brew. and Wats., Fl. Calif. I, 344; Griseb., Fl. W. I.; Wats., King Exp. 165; Cov., Fl. Ark. 194; Engl. Hoffmann, Nat. Pflanz. IV, 5, 222; Gray, Syn. Fl. I, 2, 249; Coult., Fl. Tex. 210.

Introduced in W. Europe; Brazil and W. Indies.

North America: Across continent to Mex. and Hudson Bay, N. W. T. and Labrador.

Minn. valley: Throughout; hillsides, fields, roads, thickets and forest openings.

HERB.: *Taylor 753½*, Elysian; *Ballard 891*, St. Bonifacius; *Oestlund 94*, Minneapolis; *Oestlund 95*, Hennepin Co.; *Holzinger 122*, Winona Co.; *Sandberg 315*, Red Wing.

Ambrosia trifida LINN. Spec. 987 (1753).

Wats. and Coult., Gray's Man. 6 ed. 273; Britt., Fl. N. J. 145; Webb., Fl. Neb. 147; Mac., Fl. Can. I. 240; Chap., Fl. S. St. 223; Coult., Fl. Colo. 180; Upham, Fl. Minn. 79; Mac., Fl. Can. I. 549; Roth., Wheel. Exp. 158; Cov., Fl. Ark. 194; Gray, Syn. Fl. I, 2, 249; Coult., Fl. Tex. 209.

North America: Q., Ont. to Man. and Colo.; S. to Mo., Tex., Ark. and Fla.

Minn. valley: Throughout; gullies, ravines and thickets or along roads.

HERB.: *Ballard* 845, Page lake, Carver Co.; *Taylor* 1029, Glenwood; *Sandberg* 314, Goodhue Co.; *Herb. Moyer* 133, Montevideo.

Ambrosia trifida LINN. var. **integrifolia** (MUHL.) T. and G. Fl. II, 354 (1841).

A. integrifolia MUHL. Willd. Spec. IV, 375 (1805).

Wats. and Coult., Gray's Man. 6 ed. 273; Britt., Fl. N. J. 143; Upham, Fl. Minn. 79; Mac., Fl. Can. I, 240; Chap., Fl. S. St. 223; Gray, Syn. Fl. I, 2, 249.

North America: With species; westward; Ills. to N. Y. and Va.

Minn. valley: Throughout at higher levels; local or infrequent; habitat with the species.

HERB.: *Sheldon* 1332, Lake Benton.

XANTHIUM LINN. Gen. 717 (1737).

Baillon, *Hist. Pl.* VIII, 287; Benth. and Hook., *Gen. Pl.* II, 355; Engler and Prantl, *Nat. Pflanz.* IV, 5, 222; Durand, *Ind. Gen. Phan.* 207.

Living species: 3-4; temperate and warmer regions, around the world. Russia 3; Europe, 3; Russian Europe, 2; N. America, 3-4; Canada, 1-2; California, 1; Rocky mts., 1; E. Sts., 1-2; W. Tex., 2-3.

Xanthium canadense MILL. Dict. ed. 8 (1768).

X. orientale LINN. Spec. (1753) in part.

X. carolinense DILL. Elth. II, 432 (1774).

X. americanum WALT. Fl. Car. 231 (1788).

X. macrocarpum var. *glabratum* DC. Prodr. V, 523 (1836).

X. strumarium var. *canadense* T. and G. Fl. II, 294 (1841).

X. strumarium AUCT. AMER.

Wats. and Coult., Gray's Man. 6 ed. 274; Coult., Fl. Colo., 182; Webb., Fl. Neb. 147; Mac., Fl. Can. I, 241; Upham, Fl. Minn. 79; Chap., Fl. S. St. 224; Roth., Wheel. Exp. 159; Wats., King Exp. 166; Engl. Hoffmann, *Nat. Pflanz.* IV, 5, 223; Gray, Syn. Fl. I, 2, 252; Coult. Fl. Tex. 211.

North America: N. W. T. to Tex.; W. to Calif. and Nev.; E. to Saskatchewan, Minn., Neb., Ark.? Ga.

Minn. valley: Throughout, especially N. E.; sterile places, banks and fields.

HERB.: ?*Ballard* 14n, Chaska; *Sandberg* 317, Cannon Falls.

Xanthium canadense MILL. var. **echinatum** (MURR.) GRAY, Syn. Fl. I, 2, 252 (1886).

X. echinatum MURR. Comm. Gött. VI, 32 (1792).

X. maculatum RAF. Am. Journ. Sci. I, 151 (1820).

Wats. and Coult., Gray's Man. 6 ed. 274; Britt., Fl. N. J. 143; Chap., Fl. S. St. 224; Mac., Fl. Can. I, 241; Upham, Fl. Minn. 79; Coult., Fl. Tex. 211.

South America: Chile.

North America: N. S., Q., Ont., Man. to Minn.; S. to N. J., Penn. and N. Car.

Minn. valley: S. E. and W. edges of valley; roadsides, fields and banks.

HERB: *Sheldon* 1588, Lake Benton; *Holzinger* 123, Winona Co.; *Holzinger* 124, Winona Co.

HELIOPSIS PERS. Syn. II, 473 (1807).

Kallias CASS. Dict. XXIV, 326 (1834).

Andrieuxia DC. Prodr. V, 559 (1836).

Baillon, *Hist. Pl.* VIII, 220; Benth. and Hook., *Gen. Pl.* II, 358; Durand, *Ind. Gen. Phan.* 208; Engler and Prantl, *Nat. Pflanz.* IV, 5, 226.

Living species: 7; N. and C. America, 6; C. America and Peru, 1; Canada, 2; R. mts., 1; E. Sts., 2; S. Sts., 1; Pl. Wheel., 1.

Heliopsis scabra DUNAL. Mem. Mus. V, 55 (1818?).

H. laevis var. *scabra* T. and G. Fl. II, 303 (1841).

Wats. and Coult., Gray's Man. 6 ed. 275; Mac., Fl. Can. I, 242; Webb., Fl. Neb. 147; Upham, Fl. Minn. 79; Britt., Fl. N. J. 143; Mac., Fl. Can. I, 549; Cov., Fl. Ark. 194; Gray, Syn. Fl. I, 2, 255.

North America: N. Br. ? to Red, Saskatchewan, Assiniboine valleys; N. to 49° N. lat.; S. to N. Y., N. J. and W. to Minn., Neb., Mo., Ark. and Tex.

Minn. valley: Throughout; banks and thickets or hillsides in woods.

HERB.: *Ballard* 736, Waconia; *Sheldon* 1590, Lake Benton; *Taylor* 476, Mud lake, Waseca Co.; *Taylor* 589, Minnesota lake; *Sheldon* 1175, New Ulm; *Ballard* 197, Jordan, Scott Co.; *Taylor* 314, Janesville; *Ballard* 632, Chaska; *Ballard* 320, Belle Plaine; *Taylor* 779, Glenwood; *Oestlund* 96, Minneapolis; *Holzinger* 124, Winona; *Sandberg* 318, Goodhue Co.; *Herb. Sheld*, 1920, Minneapolis; *Herb. Moyer* 134, Montevideo.

RUDBECKIA LINN. Gen. 669 (1737).

Echinacea MOENCH, Meth. 591 (1794).

Brauneria NECK. Elem. I. 17 (1790).

Helichroa RAF. Neogen. 35 (1825).

Obeliscaria CASS. Dict. XXXV, 272 (1825).

Lepachys RAF. Jour. Phys. LXXXIX, 100 (1819).

Ratibida RAF. l. c. (1819).

Dracopsis CASS. Dict. l. c. (1825).

Centrocarcha DON, Sweet. Brit. Fl. Gard. 2, 87 (1832).

? **Heliophthalmum** RAF. Fl. Lud. 72 (1817).

? **Bobartia** PETIV. herb.

Baillon, *Hist. Pl.* VIII, 218; Engler and Prantl, *Nat. Pflanz.* IV, 5, 233; Durand, *Ind. Gen. Phan.* 209; Benth. and Hook., *Gen. Pl.* II, 365.

Living species: 30±; N. America to Mexico; S. Sts., 15; E. Sts., 11; Rocky mts., 6; Canada, 4; Calif., 1-2; Pl. Wheel., 4-5; W. Tex., 8.

Rudbeckia columnaris PURSH, Fl. Am. 575 (1814).

Ratibida sulcata RAF. Journ. Phys. LXXXIX 100 (1819).

Obeliscaria columnaris DC. Prodr. V, 558 (1836).

Lepachys columnaris T. and G. Fl. II, 313 (1841).

Wats. and Coult., Gray's Man. 6 ed. 277; Mac., Fl. Can. I, 243; Webb., Fl. Neb. 146; Coult., Fl. Colo. 183; Upham, Fl. Minn. 80; Roth., Wheel. Exp. 160 in var.; Engl. Hoffmann, *Nat. Pflanz.* IV, 5, 233; Gray, Syn. Fl. I, 2, 264.

North America: N. W. T. and Saskatchewan to Colo., Minn., Neb., Arizona and Tex.

Minn. valley: W. district at higher levels; prairies and sunny banks.

HERB.: *Sheldon* 1438, Dakota line, near Elkton; *Sheldon* 1585, Lake Benton; *Taylor* 863, Glenwood; *Gedge* 7, Glyn-don, Clay Co.; *Herb. Moyer* 137, Montevideo.

Rudbeckia pinnata VENT. Hort. Cels. 71 (1800).

Rudbeckia digitata WILLD. Spec. III, 2247 (1803).

Lepachys pinnatifida RAF. Journ. Phys. LXXXIX (1819).

L. angustifolia RAF. Journ. Phys. LXXXIX (1819).

Rudbeckia tomentosa ELL. Sk. II, 453 (1824)

Obeliscaria pinnata CASS. Dict. XLVI, 401 (1825).

Lepachys pinnata T. and G. Fl. II, 313 (1841).

Wats. and Coult., Gray's Man. 6 ed. 277; Chap., Fl. S. St. 228; Upham, Fl. Minn. 80; Webb., Fl. Neb. 146; Cov., Fl. Ark. 195; Gray, Syn. Fl. I, 2, 263.

North America: Minn., Neb., Kan. and Tex. to N. Y. and Fla.

Minn. valley: Throughout; banks, hillsides, edges of thickets and along roads.

HERB.: *Sheldon* 641, Waseca; *Taylor* 649, Minnesota lake; *Sheldon* 1055, Sleepy Eye; *Taylor* 561, Minnesota lake; *Ballard* 774, Swan lake, Carver; Co.; *Sheldon* 1463, Pipestone; *Ballard* 539, Cleary's lake, Scott Co.; *Herrick* 158, Minneapolis; *Oestlund* 97, Minneapolis; *Sandberg* 323, Goodhue Co.

Rudbeckia hirta LINN. Spec. 907 (1753).? *R. gracilis* NUTT. Gen. II, 178 (1818).? *R. discolor* ELL. Sk. II, 453 (1824).*R. serotina* NUTT. Journ. Acad. Phil. VII, 80 (1834).*R. strigosa* NUTT. Trans. Am. Phil. Soc. VII, 354 (1841).

Wats. and Coult., Gray's Man. 6 ed. 276; Britt., Fl. N. J. 144; Webb., Fl. Neb. 146; Upham, Fl. Minn. 80; Mac., Fl. Can. I, 242; Chap., Fl. S. St. 227; Coult., Fl. Colo. 183; Roth., Wheel. Exp. 160; Cov., Fl. Ark. 195; Gray, Syn. Fl. I, 2, 260; Coult., Fl. Tex. 215.

North America: Ont. to Saskatchewan and Colo.; S. to N. Y. and Fla.; W. to Minn., Dak., Neb., Ark. and Tex.

Minn. valley: Throughout; dry places on hills or in fields.

HERB.: *Sheldon* 1275, Lake Benton; *Taylor* 790, Glenwood; *Sandberg* 221, Cannon Falls; *Leonard* 25, Minneapolis; *Bailey* 303, Vermilion lake; *Huntington* 8, Rock Co.; *Kassube* 136, Minneapolis; *Herrick* 157, Minneapolis; *Ankeny* 2, Stillwater; *Sandberg* 322, Goodhue Co.; *Herb. Sheld.* 1923, Minneapolis.

Rudbeckia subtomentosa PURSH, Fl. Am. 575 (1814).*R. triloba* var. *a.* MICHX. Fl. N. Am. II, 144 (1803).*R. tomentosa* ELL. Sk. II, 453 (1824).*Centrocapha triloba* DON, Sweet. Brit. Fl. Gard. 61 (1826).*Rudbeckia odorata* NUTT. Journ. Acad. Phil. VII, 78 (1834).

Wats. and Coult., Gray's Man. 6 ed. 276; Upham, Fl. Minn. 80; Cov., Fl. Ark. 195; Gray, Syn. Fl. I, 2, 260; Coult., Fl. Tex. 215.

North America: Wisc. and Minn. to Ill., Mo., Ark. and Tex.

Minn. valley: Reported from N. E. district; infrequent; prairies or hillsides.

Rudbeckia laciniata LINN. Spec. 906 (1753).*R. quinata* and *digitata* MILL. Dict. ed. 8 (1768).

Wats. and Coult., Gray's Man. 6 ed. 276; Britt., Fl. N. J. 141; Webb., Fl. Neb. 146; Upham, Fl. Minn. 80; Mac., Fl. Can. I, 242; Coult., Fl. Colo. 183; Chap., Fl. S. St. 227; Mac., Fl. Can. I, 549; Roth., Wheel. Exp. 160; Cov., Fl. Ark. 195; Engl. Hoffmann, Nat. Pflanz. IV, 5, 233; Gray, Syn. Fl. I, 2, 262.

North America: Q., Ont. to Assiniboia and Mont.; S. to N. J. and Fla.; W. to Colo., Arizona and N. Mex.

Minn. valley: Throughout; thickets and edges of woods.

HERB.: *Taylor* 802, Glenwood; *Taylor* 977, Glenwood; *Ballard* 749, Waconia; *Sheldon* 1267, Lake Benton; *Sheldon* 18, Elysian; *Herrick* 156, Minneapolis; *Sandberg* 320, Goodhue Co.; *Herb. Moyer* 136, Montevideo.

Rudbeckia angustifolia (DC.) B. and H. Gen. Pl. II, 365 (1873).

Echinacea angustifolia DC. Prodr. V, 554 (1836).

E. pallida and *sanguinea* NUTT. Trans. Am. Phil. Soc. VII, 354 (1841).

Wats. and Coult., Gray's Man. 6 ed. 275; Webb., Fl. Neb. 147; Coult., Fl. Colo. 182; Upham, Fl. Minn. 80; Chap., Fl. S. St. 226; Mac., Fl. Can. I, 243, 549; Cov., Fl. Ark. 194; Gray, Syn. Fl. I, 2, 258.

North America: Man to 49° N. lat.; S. to Minn., Wisc., Ill., Neb., Colo., Ark., Alab. and Tex.

Minn. valley: W. districts; New Ulm to Stearns Co.; prairies and hillsides.

HERB.: *Taylor* 748, Glenwood; *Sheldon* 737, Sigel township, Brown Co.; *Sheldon* 1176, New Ulm; *Sheldon* 1330, Lake Benton; *Taylor* 748a, Glenwood; *Sheldon* 1138, Springfield; *Sandberg* 319, Red Wing; *Huntington* 7, Rock Co.; *Herb. Moyer* 135, Montevideo.

HELIANTHUS LINN. Gen. 668 (1737).

Harpalum CASS. Bull. Philom. (1818).

Echinomeria NUTT. Trans. Phil. Soc. 2, VII, 356 (1841).

Flourensia DC. Prodr. V, 585 (1836).

Diomedea BERT. and COLL. Mem. Tur. XXXVIII, 35 (1835).

Linsecomia BUCKL. Proc. Phil. Acad. 451 (1861).

Corona-solis TOURN. Inst. 489 (1700).

Chrysis REN. ex Endl. Gen. 2538 (1840).

Vosacan ADANS. Fam. II, 130 (1763).

Discomela RAF. Neogen. 3 (1825) *part.*

Baillon, *Hist. Pl.* VIII, 201; Benth. and Hook., *Gen. Pl.* II, 376; Durand, *Ind. Gen. Phan.* 210; Engler and Prantl, *Nat. Pflanz.* IV, 5, 235 (Hoffmann).

Living species: 55-60; principally N. America; some, C. America; a few in Peru. Canada, 13; Rocky mts., 9-10; E. Sts., 22-23; California, 5-6; S. Sts., 25; Pl. Wheel., 5; Pl. King, 5; W. Tex., 15.

Helianthus tuberosus LINN. Spec. 905 (1753).

H. doronocoides T. and G. Fl. II, 327 (1841) *in part.*

Wats. and Coult., Gray's Man. 6 ed. 280; Chap., Fl. S. St. 230; Upham, Fl. Minn. 82; Coult., Fl. Colo. 187; Mac., Fl. Can. I, 245, 540; Webb., Fl. Neb. 146; Britt., Fl. N. J. 145; Herd., Fl. Eur. Russ. 66; Engl. Hoffmann, *Nat. Pflanz.* IV, 5, 236; Gray, Syn. Fl. I, 2, 280; Hart., Fl. Scand. I, 553.

Introduced in Russia and Scandinavia.

North America: N. S., N. Br., Q., Ont. to N. J. and Penn. and Mid. Ga.; W. to Minn. and Neb.

Minn. valley: Throughout; alluvial soil along streams or around lakes.

HERB.: *Sheldon 1413*, Lake Benton; *Huntington 9*, Rock Co.

***Helianthus tuberosus* var. *subcanescens* GRAY**, Syn. Fl. I, 2, 280 (1886).

Wats. and Coult., Gray's Man. 6 ed. 280; Coult., Fl. Colo. 187; Upham, Fl. Minn. 82.

North America: Minn., Dak. and Mo.

Minn. valley: Reported from prairies of S. W. district.

***Helianthus decapetalus* LINN.** Spec. 905 (1753).

H. frondosus LINN. Amoen. IV, 290 (1759).

H. strumosus WILLD. Spec. III, 2422 (1804).

H. tenuifolius ELL. Sk. II, 420 (1824).

Wats. and Coult., Gray's Man. 6 ed. 280; Britt., Fl. N. J. 145; Upham, Fl. Minn. 82; Mac., Fl. Can. I, 245, 550; Chap., Fl. S. St. 231; Gray, Syn. Fl. I, 2, 280; Webb., Appx. Neb. 44.

North America: N. Br., Q., Ont. to Georgian bay and Minn.; S. to Ga. in mts.; W. to Ill., Neb. and Ky.

Minn. valley: Throughout; local or rare; thickets, banks of streams or copses.

HERB.: ? *Herrick 161*, Minneapolis; *Taylor 928*, Glenwood; *Herb. Moyer 141*, Montevideo.

***Helianthus trachelifolius* WILLD.** Spec. III, 2241 (1804).

H. prostratus WILLD. Spec. III, 2242 (1804).

Wats. and Coult., Gray's Man. 6 ed. 280; Upham, Fl. Minn. 82; Cov., Fl. Ark. 195; Gray, Syn. Fl. I, 2, 280.

North America: Penn.?, Ohio to Minn., Mo. and Ark.

Minn. valley: Reported from N. E. district; infrequent or doubtful; thickets and edges of woods.

***Helianthus strumosus* LINN.** Spec. 905 (1753).

H. laevis WALT. Fl. Car. 215 (1788).

Wats. and Coult., Gray's Man. 6 ed. 280; Britt., Fl. N. J. 145; Mac., Fl. Can. I, 244; Upham, Fl. Minn. 82; Chap., Fl. S. St. 231; Cov., Fl. Ark. 195; Engl. Hoffman, Nat. Pflanz. IV, 5, 236; Gray, Syn. Fl. I, 2, 279.

North America: Ont. to N. W. T.; S. to Minn., Mo. and Ark.; E. to N. Eng., N. J., Va. and Ga.

Minn. valley: Throughout; rare or local; banks, thickets and ravines.

HERB.: ? *Kassube 138*, Minneapolis.

***Helianthus hirsutus* RAF.** Ann. Nat. 141 (1820).

? *H. diversifolius* ELL. Sk. II, 416 (1824).

? *H. hispidulus* ELL. Sk. II, 416 (1824).

Wats. and Coult., Gray's Man. 6 ed. 280; Webb., Fl. Neb. 146; Upham, Fl. Minn. 82; Chap., Fl. S. St. 231; Cov., Fl. Ark. 195; Gray, Syn. Fl. I, 2, 279.

North America: Ohio to Wisc. and Minn.; S. to Va., Tenn., Ga. and Tex.

Minn. valley: W. districts; prairies and sunny banks.

HERB.: *Wickersheim* 79, Idlewild, Lincoln Co.

***Helianthus divaricatus* LINN.** Spec. 906 (1753).

H. truncatus SCHWEIN. Ell. Sk. II, 416 (1824).

Wats. and Coult., Gray's Man. 6 ed. 280; Britt., Fl. N. J. 145; Webb., Fl. Neb. 146; Upham, Fl. Minn. 82; Mac., Fl. Can. I, 245; Chap., Fl. S. St. 231; Gray, Syn. Fl. I, 2, 279.

North America: Ont. to S. Man.; S. to N. Eng., N. J., Fla.; W. to Minn., Dak., Neb., Kan. and La.

Minn. valley: Throughout; local or infrequent; thickets and copses.

HERB.: *Ballard* 711, Waconia; *Taylor* 927, Glenwood; *Sheldon* 472, Madison Lake; *Holzinger* 127, Winona bluffs; *HerRick* 160, Minneapolis.

***Helianthus maxmiliani* SCHRAD.** Ind. Sem. Gött. (1835).

H. maxmiliani var. *asperrimus* GRAY, Pl. Lindh. I, 41 (1845).

Wats. and Coult., Gray's Man. 6 ed. 279; Webb., Fl. Neb. 146; Upham, Fl. Minn. 81; Mac., Fl. Can. I, 245, 550; Coult., Fl. Colo. 187; Gray, Syn. Fl. I, 2, 277; Coult., Fl. Tex. 219.

North America: Saskatchewan and Man. to Minn., Neb. and Tex.

Minn. valley: S. and S. W. districts; also N. E.; local; low places and edges of swamps.

HERB.: *Sheldon* 1454, Pipestone; *Sheldon* 1281, Lake Benton; *Sandberg* 327, Red Wing; *Oestlund* 99, Minneapolis; *Oestlund* 100, Minneapolis; *Herb. Moyer*, 139, Montevideo.

***Helianthus giganteus* LINN.** Spec. 905 (1753).

H. altissimus LINN. Spec. 2 ed. 1278 (1762).

H. gigas MICHX. Fl. N. Am. II, 141 (1803).

H. tuberosus PARRY, Ow. Rep. Minn. Surv. 614 (1849).

Wats. and Coult., Gray's Man. 6 ed. 279; Britt., Fl. N. J. 145; Webb., Fl. Neb. 146; Mac., Fl. Can. I, 244; Upham, Fl. Minn. 81; Chap., Fl. S. St. 230; Wats., King Exp. 169; Roth., Wheel. Exp. 162 *in var.*; Engl. Hoffmann, Nat. Pflanz. IV, 5, 236; Gray, Syn. Fl. I, 2, 276; Coult., Fl. Tex. 219.

North America: Ont. to Man. and Rockies; S. to Minn., Neb. and Mo.; E. to N. Eng., N. J., Va., Alab. and La.

Minn. valley: N. E. district; rare; woods and thickets or shaded banks.

HERB.: *Bailey* 456, Mud lake; *Roberts* 64, Beaver bay; *Sandberg* 328, Red Wing.

***Helianthus grosse-serratus* MART.** Sel. Sem. Hort. Lovan. (—).

Wats. and Coult., Gray's Man. 6 ed. 279; Webb., Fl. Neb. 146; Upham, Fl. Minn. 81; Coult., Fl. Colo. 187; Cov., Fl. Ark. 195; Gray, Syn. Fl. I, 2, 276; Coult., Fl. Tex. 219.

North America: Ohio to Minn., Dak. and Colo.; S. to Texas.

Minn. valley: W. and central districts; moist prairies and open banks of streams.

HERB.: *Sheldon* 1282, Lake Benton; *Holzinger* 126, Winona Co.; *Sandberg* 329, Red Wing; *Herb. Moyer* 140, Montevideo.

Helianthus laetiflorus PERS. Syn. II, 476 (1807).

H. atrorubens LAM. Enc. Meth. III, 86 (1789).

Wats. and Coult., Gray's Man. 6 ed. 278; Webb. Fl. Neb. 146; Chap., Fl. S. St. 230; Cov., Fl. Ark. 195?; Gray, Syn. Fl. I, 2, 275.

North America: Ohio to W. Ga.; W. to Minn., Dak., Neb., Ark. ? and Tex.

Minn. valley: S. central district; dry open places and edges of woods.

HERB.: ? *Sandberg* 326, Red Wing.

Helianthus rigidus (CASS.) DESF. Hort. Par. 3 ed. 184 (1829).

H. atrorubens MICHX. Fl. N. Am. II, 140 (1803) *in part*.

H. diffusus SIMS, Bot. Mag. 2020 (—).

Harpalum rigidum CASS. Dict. XX, 200 (1826).

Helianthus missuricus SPRENG. Syst. III, 618 (1826).

H. scaberrimus ELL. Sk. II, 423 (1824).

H. missouriensis and *crassifolius* NUTT. Trans. Am. Phil. Soc. VII, 366 (1841).

Wats. and Coult., Gray's Man. 6 ed. 278; Webb., Fl. Neb. 146; Upham, Fl. Minn. 81; Mac., Fl. Can. I, 244; Coult., Fl. Colo. 186; Gray, Syn. Fl. I, 2, 274; Coult., Fl. Tex. 218.

North America: Saskatchewan to Rockies; E. to Minn and Mich.; S. to Dak., E. Colo. and Tex.

Minn. valley: Throughout; fields, banks of streams and roadsides or embankments.

HERB.: *Sheldon* 1336, Lake Benton; *Taylor* 1021, Glenwood; *Taylor* 944, Glenwood; *Taylor* 1021, Glenwood; *Sheldon* 1283, Verdi, Lincoln Co.; *Sheldon* 1394, Lake Benton—flowers all ligulate; *Kassube* 137, Minneapolis; *Oestlund* 98, Minneapolis; *Oestlund* 99, Minneapolis; *Holzinger* 125, Winona bluffs; *Sandberg* 325, Goodhue Co.; *Herb. Moyer* 138, Montevideo; *Sheldon* 1601½, Minneapolis.

Helianthus petiolaris NUTT. Jour. Acad. Phil. II, 115 (1821).

H. patens LEHM. Ind. Sem. Hamb. (1828).

H. integrifolius NUTT. Trans. Am. Phil. Soc. VII, 636 (1841).

Wats. and Coult., Gray's Man. 6 ed. 278; Gray, Syn. Fl. I, 2, 272; Upham, Fl. Minn. 80; Coult., Fl. Colo. 186; Mac., Fl. Can. I, 244; Brew. and Wats., Fl. Calif. I, 353; Webb., Fl. Neb. 146; Coult., Fl. Tex. 217.

North America: Saskatchewan to Minn., Neb. and Tex.; W. to Oregon and Arizona.

Minn. valley: S. central district and S. W. on prairies or sterile hillsides.

HERB.: *Sheldon 1191*, New Ulm.

Helianthus annuus LINN. Spec. 904 (1753).

H. tubaeformis NUTT. Gen. II, 177 (1818).

H. ovatus LEHM. Ind. Sem. Hamb. (1828).

H. lenticularis DOUGL. Bot. Reg. XV, t. 1225 (1825).

H. multiflorus HOOK. Fl. Bor.-Am. I, 313 (1833).

H. macrocarpus DC. Prodr. V, 586 (1836).

Wats. and Coult., Gray's Man. 6 ed. 278; Upham, Fl. Minn. 80; Mac., Fl. Can. I, 243; Webb., Fl. Neb. 146; Britt., Fl. N. J. 144; Chap., Fl. S. St. 232; Coult., Fl. Colo. 186; Brew. and Wats., Fl. Calif. I, 353; Herd., Fl. Eur. Russ. 66; Roth., Wheel. Exp. 162; Wats., King Exp. 169; Cov., Fl. Ark. 195; Engl. Hoffmann, Nat. Pflanz. IV, 5, 236; Gray, Syn. Fl. I, 2, 272; Coult., Fl. Tex. 217.

Introduced in Russia.

North America: Saskatchewan to Washington; S. to Nev., Calif., Colo., Tex. and Mex.; E. to Minn., Iowa, Ark., and intro. further E. to Atl. coast.

Minn. valley: S. E. district and doubtless N. W.; waste ground.

HERB.: *Sandberg 324*, Red Wing.

COREOPSIS LINN. Gen. 670 (1737).

Chrysostemma LESS. Syn. Comp. 227 (1832).

Diodonta and **Heterodonta** NUTT. Trans. Phil. Soc. 2, VII, 360 (1841).

Acispermum NECK. Elem. I, 34 (1790).

Electra DC. Prodr. V, 630 (1836).

Tuckermannia NUTT. l. c. 363 (1841).

Leachia CASS. Dict. XXV, 388 (1825).

Chrysomelea TAUSCH. Hort. Canal. (1823).

Coreopsides MOENCH, Meth. 594 (1794).

Anacis SCHRANK, Denkschr. Acad. Mun. V, 5 (—).

Calliopsis REICH. Ic. and Descr. 70 (1822).

Diplosastera TAUSCH. Hort. Can. ex Flora (1824).

Prestinaria SCH. BIP. Walp. Rep. VI, 162 (1847).

Epilepis BENTH. Pl. Hartw. 17 (1839).

Campylotheca and **Dolicotheca** CASS. Dict. LI, 476 (1826)

? **Peramibus** RAF. Ann. Nat. I, 14 (1820).

Leptosyne DC. Prodr. V, 531 (1836).

Agarista DC. l. c. 569 (1836).

Pugiopappus TORR. Whipple Exp. 48 (1856).

Epilepis BENTH. Pl. Hartw. (1839).

Baillon, *Hist. Pl.* VIII, 221 (sub *Bidens*); Benth. and Hook, *Gen. Pl.* II, 385; Durand, *Ind. Gen. Phan.* 212; Engler and Prantl, *Nat. Pflanz.* IV, 5, 242 (Hoffmann).

Living species: 70-75; N. and S. America, tropical Africa and Sandwich Islands; N. America, 30±; Canada, 7; Rocky mts., 2; E. Sts., 18; S. Sts., 20; Pl. Wheel., 2; W. Tex., 9.

Coreopsis aristosa MICHX. Fl. N. Am. II, 140 (1803).

C. aristata WILLD. Spec. III, 2253 (1804).

Diodonta aristosa NUTT. Trans. Am. Phil. Soc. VII, 360 (1841).

Wats. and Coult., Gray's Man. 6 ed. 283; Upham, Fl. Minn. 83; Cov., Fl. Ark. 196; Gray, Syn. Fl. I, 2, 295.

North America: Ohio to Minn., Mo., Ark. and W. La.

Minn. valley: S. central district; rare; peat bogs.

Coreopsis trichosperma MICHX. Fl. N. Am. II, 139 (1803).

C. aurea LINDL. Bot. Reg. XV, t. 1228 (1829).

Diodonta coronata NUTT. Trans. Am. Phil. Soc. VII, 360 (1841).

Wats. and Coult., Gray's Man. 6 ed. 283; Chap., Fl. S. St. 234; Mac., Fl. Can. I, 246 and 550 in var; Upham, Fl. Minn. 83; Britt., Fl. N. J. 146; Gray, Syn. Fl. I, 2, 295.

North America: Detroit river to Mass.; S. to N. Car.; W. to Ill. and Minn.?

Minn. valley?: Reported from N. E. district; doubtful.

Coreopsis palmata NUTT. Gen. II, 573 (1818).

Calliopsis palmata SPRENG. Syst. III, 611 (1826).

Coreopsis pauciflora LEHM. Ind. Sem. Hamb. (1833).

C. praecox FRESN. Ind. Sem. Frankf. (1838).

Wats. and Coult., Gray's Man. 6 ed. 282; Upham, Fl. Minn. 82; Webb., Fl. Neb. 146; Mac., Fl. Can. I, 551; Cov., Fl. Ark. 196; Gray, Syn. Fl. I, 2, 293; Coult., Fl. Tex. 223.

North America: Man.? Mich. and Minn. to Neb., Ark. and W. Tex.

Minn. valley: Throughout; hillsides, copses, edges of woods and thickets, or prairies.

HERB.: *Taylor* 170, Janesville; *Taylor* 556, Minnesota lake; *MacMillan* 16, Glenwood; *Sheldon* 643, Waseca; *Sheldon* 1030, Sleepy Eye—form with upper leaves entire; *Sheldon* 900, Cottonwood river, near Sleepy Eye; *Ballard* 384, Jordan, Scott Co.; *Sheldon* 1132, Springfield; *Ankeny* 3, Stillwater; *Kassube* 139, Minneapolis; *Herrick* 162, Minneapolis; *Arthur* 1000, Elk river; *Sandberg* 330, Red Wing; *Herrick* 163, Minneapolis; *Oestlund* 101, Minneapolis; *Herb. Moyer* 142, Chippewa Co.

Coreopsis tinctoria NUTT. Journ. Acad. Phil. II, 114 (1821).

Calliopsis bicolor REICH. Mag. t. 70 (1824).

Wats. and Coult., Gray's Man. 6 ed. 282; Mac., Fl. Can. I, 246; Upham, Fl. Minn. 82; Webb., Fl. Neb. 146; Coult., Fl. Colo. 189; Roth. Wheel.

Exp. 164; Cov., Fl. Ark. 196; Engl. Hoffmann, Nat. Pflanz. IV, 5, 243; Gray, Syn. Fl. I, 2, 291; Coult., Fl. Tex. 222.

North America: Saskatchewan and lat. 49° N. to Ark. and Tex.; W. to Colo. and Arizona; E. to La.

Minn. valley: Reported from moist prairies of S. W. and W. districts.

BIDENS LINN. Gen. 641 (1737).

Pluridens and **Edwardsia** NECK. Elem. I, 86, 87 (1790).

Kerneria MOENCH, Meth. 595 (1794).

Ceratocephalus VAILL. ex DC. Prodr. V, 594 (1836).

Delucia DC. Prodr. V, 633 (1836).

Adenolepis LESS. Linn. VI, 510 (1832).

Baillon, *Hist. Pl.* VIII, 221; Benth. and Hook., *Gen. Pl.* II, 387; Durand, *Ind. Gen. Phan.* 212; Engler and Prantl, *Nat. Pflanz.* IV, 5, 244 (Hoffmann).

Living species: 60-90; all temperate and warmer regions, especially in America; Russia, 3; Europe, 4; Russian Europe, 3; North America, 15; E. Sts., 6; Canada, 6; Rocky mts., 5; S. Sts., 5; California, 2; Pl. Wheel., 3; W. Tex., 5.

Bidens beckii TORR. Spreng. Neu. Entd. II, 135 (1824).

Wats. and Coult., Gray's Man. 6 ed. 285; Britt., Fl. N. J. 147; Upham, Fl. Minn. 83; Mac., Fl. Can. I, 247; Engl. Hoffmann, Nat. Pflanz. IV, 5, 245; Gray, Syn. Fl. I, 2, 298.

North America: St. Lawrence, Q., Ont. to Man., Red valley and Porcupine mts.; S. to E. Mass. and N. J., and to Minn. and Mo.

Minn. valley: N. E. district; aquatic, in ponds, lakes and sluggish streams

HERB.: *Holtz* 2, Minneapolis; *Herrick* 166, Minneapolis; *Herrick* 167, Minneapolis; *Bailey* 541, Long lake.

Bidens laevis (LINN.) B. S. P. Cat. N. Y. (1888).

Helianthus laevis LINN. Spec. 906 (1753).

Coreopsis bidens and *perpoliata*? WALT. Fl. Car. 215 (1788).

Bidens chrysanthemoides MICHX. Fl. N. Am. II, 136 (1803).

B. helianthoides HBK. Nov. Gen. et. Spec. IV, 230 (1820).

B. quadriaristata DC. Prodr. V, 593 (1836).

Wats. and Coult., Gray's Man. 6 ed. 285; Britt., Fl. N. J. 147; Webb., Fl. Neb. 146; Upham, Fl. Minn. 83; Chap., Fl. S. St. 237; Coult., Fl. Colo. 190; Brew. and Wats., Fl. Calif. I, 357; Mac., Fl. Can. I, 247; Cov., Fl. Ark. 196; Gray, Syn. Fl. I, 2, 296; Coult., Fl. Tex. 223.

North America: N. S., N. Br., Q., Ont. to Man. and Calif.; S. to Fla. and Mex.

Minn. valley: Throughout; swamps and shaded wet banks of streams or by springs.

HERB.: *Sheldon* 1470, Pipestone; *Winchell* 10, Richfield; *Herrick* 165, Minneapolis; *Holzinger* 128, Winona; *Sandberg* 333, Cannon Falls; *Herb. Moyer* 144, Montevideo.

***Bidens cernua* LINN. Spec. 832 (1753).**

Coreopsis bidens LINN. Spec. 908 (1753).

Bidens cernua var. *elata* T. and G. Fl. II, 352 (1841)

B. quadriaristata var. *dentata* NUTT. Trans. Am. Phil. Soc. VII, 368 (1841).

Wats. and Coult., Gray's Man. 6 ed. 285; Britt., Fl. N. J. 147; Mac., Fl. Can. I, 247; Upham, Fl. Minn. 83; Webb., Fl. Neb. 145; Coult., Fl. Colo. 189; Brew. and Wats., Fl. Calif. I, 357; Forbes and Hems., Fl. Syn. 435; Hook., Fl. Gt. Brit. 210; Led., Fl. Ross. II, 517; Nym., Fl. Eur.; Herd., Fl. Eur. Russ. 66; Cov., Fl. Ark. 196; Engl. Hoffmann, Nat. Pflanz. IV, 5, 244; Gray, Syn. Fl. I, 2, 296; Hart, Fl. Scand. I, 2.

N. Eur. to Caucasus; N. Asia to China.

North America: N. S., N. Br. to Hudson Bay and Saskatchewan to Mont. and Oregon; S. to Va., Mo. and Colo.

Minn. valley: Throughout; infrequent; wet places or shaded banks near water's edge.

HERB.: *Sheldon* 1515, Lake Benton; *Taylor* 1154, Glenwood; *Roberts* 65, Stewart river; *Leiberg* 36, Blue Earth Co.

***Bidens connata* MUHL. Willd. Spec. III, 1718 (1803).**

B. tripartita BIGEL. Fl. Bost. 2 ed. 294 (1824).

B. petiolata NUTT. Journ. Acad. Phil. VII, 99 (1834).

B. connata var. *comosa* GRAY. Man. 5 ed. 261 (1867).

Wats. and Coult., Gray's Man. 6 ed. 284; Mac., Fl. Can. I, 247; Upham, Fl. Minn. 83; Chap., Fl. S. St. 236; Webb., Fl. Neb. 145; Britt., Fl. N. J. 147; Gray, Syn. Fl. I, 2, 296.

North America: N. S., N. Br. to Saskatchewan and Nebr.; S. to Ill., Mo., Ga. and Tex.

Minn. valley: Forest district to Blue Earth Co.; damp places and near streams or pools.

HERB.: *Ballard* 712, Waconia; *Herrick* 164, Minneapolis; this is the var. *pinnata* Watson. *Sandberg* 332, Red Wing.

***Bidens frondosa* LINN. Spec. 832 (1753).**

Wats. and Coult., Gray's Man. 6 ed. 284; Britt., Fl. N. J. 146; Webb., Fl. Neb. 145; Chap., Fl. S. Sts. 236; Mac., Fl. Can. I, 247, 551; Upham, Fl. Minn. 83; Coult., Fl. Colo. 189; Cov., Fl. Ark. 196; Gray, Syn. Fl. I, 2, 296; Coult., Fl. Tex. 223.

North America: N. S., N. Br. to Saskatchewan and Colo.; S. to Gulf of Mexico, Fla. and Tex.

Minn. valley: Throughout; frequent; moist shady places or along roads.

HERB.: *Sheldon* 1414, Lake Benton; *Taylor* 1082,

Glenwood; *Bailey* 72, Vermilion Lake; *Sandberg* 331, Cannon Falls; *Herb. Moyer* 143, Montevideo.

HELENIUM LINN. Gen. 664 (1737).

Tetrodus and **Dougaldia** CASS. Dict. LV, 264, 270 (1834).

Mesodetra RAF. Fl. Lud. 141 (1817).

Brassavola ADANS. Fam. II, 127 (1763).

Oxylepis BENTH. Pl. Hartw. 87 (1839).

Leptapoda NUTT. Gen. II, 174 (1818).

Ambliolepis DC. Prodr. V, 667 (1836).

Espeletiopsis SCH. Bip. Herb.

Cephalophora CAV. Ic. VI, 79 (1801).

Actinea JUSS. Ann. Mus. II, 425 (1804).

Graemia HOOK. Exot. Fl. 189 (1823).

Actinella NUTT. Gen. II, 173 (1818).

Baillon, *Hist. Pl.* VIII, 241; Benth. and Hook., *Gen. Pl.* II, 413, 414; Durand, *Ind. Gen. Phan.* 216; Engler and Prantl, *Nat. Pflanz.* IV. 5, 216 (Hoffmann).

Living species: 30±; N. America, especially westward; E. Sts., 2; S. Sts., 4; Canada, 1; W. Tex., 9.

Helenium autumnale LINN. Spec. 866 (1753).

H. pubescens AIT. Hort. Kew. III, 287 (1789).

H. canaliculatum LAM. Journ. Hist. Nat. II, 213 (1792).

H. pumilum WILLD. Enum. Suppl. 60 (1813).

H. longifolium SM. Rees Cycl. (1817?).

H. tubuliflorum DC. Prodr. V, 666 (1836).

H. altissimum and *commutatum* LINK, Ind. Sem. Berol. (1840).

H. grandiflorum and *montanum* NUTT. Trans. Am. Phil. Soc. VII, 384 (1841).

Wats. and Coult., Gray's Man. 6 ed. 287; Coult., Fl. Colo. 196; Upham, Fl. Minn. 84; Chap., Fl. S. St. 239; Mac., Fl. Can. I, 249, 552; Brew. and Wats., Fl. Calif. I, 393; Roth., Wheel Exp. 172; Wats., King Exp. 175; Cov., Fl. Ark. 197; Engl. Hoffmann, Nat. Pflanz. IV, 5, 263; Gray, Syn. Fl. I, 2, 349; Webb., Appx. Neb. 41; Coult., Fl. Tex. 232.

North America: Q. to L. Huron, Arctic circle and Pac.; S. to Oregon, Nev., Arizona, Minn., Ark., Fla.

Minn. valley: Throughout; river banks, lake shores and edges of swamps.

HERB.: *Taylor* 1017, Glenwood; *Sheldon* 1312, Lake Benton; *Sheldon* 1464, Pipestone; *Taylor* 1087, Glenwood; *Sandberg* 334, Goodhue Co.; *Herb. Sheld.* 1811, Minneapolis; *Herb. Moyer* 145, 146, Montevideo.

GAILLARDIA FOUGER. Mem. Ac. Sci. Par. (1786).

Galardia LAM. Enc. Meth. II, 590 (1786).

Calonnea BUCHOZ. Icon. t. 126 (1786).

Virgilia L'HER. Diss. (1789).

Agassizia GRAY and ENGELM. Jour. Bost. Nat. Hist. Soc. VI, 229 (1850).

Guntheria SPRENG. *Syst.* III, 356 (1826).

Cercostylos LESS. *Syn. Comp.* 239 (1832).

Polypteris LESS. *Linn.* VI, 218 (1832).

Galorida REUSCH. *Nom.* 251 (1797).

Benth. and Hook., *Gen. Pl.* II, 414; Baillon, *Hist. Pl.* VIII, 241; Durand, *Ind. Gen. Phan.* 216; Engler and Prantl, *Nat. Pflanz.* IV, 5, 263 (Hoffmann).

Living species: 12; N. and C. America to S. America and Patagonia. N. America, 10; S. America, 1; Texas, Arizona and Utah, 10; Canada, 1-2; S. E. Sts., 2-3; S. and W. Tex., 7.

Gaillardia aristata PURSH, *Fl. Am.* 573 (1814).

G. bicolor HOOK. *Fl. I.* 315 (1833).

G. bicolor var. *aristata* NUTT. *Gen.* II, 175 (1818).

G. rustica CASS. *Dict.* XVIII, 20 (1825).

G. lanceolata DC. *Prodr.* V, 362 (1836).

Wats. and Coult., *Gray's Man.* 6 ed. 288; Gray, *Syn. Fl.* I, 2, 352; Upham, *Fl. Minn.* 83; Coult., *Fl. Colo.* 197; Brew. and Wats., *Fl. Calif.* I, 392; Mac., *Fl. Can.* I, 250; Coult., *Fl. Tex.* 233.

North America: Saskatchewan and Brit. Col. to Oregon and California; S. to Minn., Colo. and Tex.

Minn. valley: Reported from N. W. and S. W. districts; rare or local; prairies.

HERB.: *Gedde* 18, Riverton.

DYSSODIA CAV. *Ann. Cienc. Nat.* VI, 334 (1803).

Boebera WILLD. *Spec.* III, 2125 (1804).

Clomenocoma CASS. *Dict.* IX. 416 (1825).

Comaclinium SCHEIDW. *Pl. Serres*, 756 (—).

Rosilla LESS. *Syn. Comp.* 245 (1832).

Lebetina CASS. *Dict.* XXV, 394 (1825).

Adenophyllum PERS. *Syn.* II, 458 (1807).

Willdenowa CAV. *Ic.* 61 (1791).

Schlechtendahlia WILLD. *Spec.* III, 2125 (1804).

Boebera LESS. *Syn. Comp.* 237 (1832).

Hymenatherum CASS. *Bull. Philom.* (1817).

Aciphyllaea A. GRAY, *Pl. Fendl.* 91 (1849).

Gnaphalopsis DC. *Prodr.* VII, 258 (1839).

Thymophylla LAG. *Elench. Matr.* 25 (1816).

Lowellia A. GRAY, *Pl. Fendl.* 89 (1849).

Baillon, *Hist. Pl.* VIII, 253 (*sub Tagetes* Linn.); Benth. and Hook, *Gen. Pl.* II, 408, 410; Engler and Prantl, *Nat. Pflanz.* IV, 5, 265; Durand, *Ind. Gen. Phan.* 215.

Living species: 35±; Central and S. W. N. America; 1 sp., Peru to Patagonia. U. S., 16; all in W. and S. W. region except *D. papposa* (Vent.).

Dyssodia papposa (VENT.) HITCHCOCK, *Fl. Ames.* 503 (1891).

Tagetes papposa VENT. Hort. Cels (1800).

Boebera chrysanthemoides WILLD. Spec. III, 2125 (1804).

Dyssodia chrysanthemoides LAG. Nov. Gen. et Spec. 29 (1816).

Boebera glandulosa PERS. Syn. II, 459 (1807).

Dyssodia fastigiata DC. Prodr. V, 639 (1836).

Wats. and Coult., Gray's Man. 6 ed. 288; Webb., Fl. Neb. 145; Upham, Fl. Minn. 83; Mac., Fl. Can. I, 2, 251; Coult., Fl. Colo. 197; Cov., Fl. Ark. 197; Engl. Hoffmann, Nat. Pflanz. IV, 5, 265; Gray, Syn. Fl. I, 2, 356; Coult., Fl. Tex. 236.

North America: Ont. to Minn.; S. to N. Y., Ga., La.; W. to Neb., Colo., Tenn., Ark., Arizona and Mex.

Minn valley: S. W. edge; infrequent; banks of streams or cool roadsides.

HERB.: *Leiberg* 37, Rock Co.

ACHILLEA LINN. Gen. 661 (1737).

Ptarmica NECK. Elem. I, 15 (1790).

Millefolium TOURN. Inst. 460 (1700).

Baillon, *Hist. Pl.* VIII, 279 (*sub Santolina*); Durand, *Ind. Gen. Phan.* 217; Engler and Prantl, *Nat. Pflanz.* IV, 5, 272 (Hoffmann); Benth. and Hook., *Gen. Pl.* II, 419.

Living species: 80 ±; N. temperate regions, especially in old world. Russia, 20; Europe, 30; Russian Europe, 11; N. America, 3; Canada, 3; S. Sts., 1; E. Sts., 1; California, 1; Pl. Wheel., 1; W. Tex., 1.

Achillea millefolium LINN. Spec. 1267 (1753).

A. tomentosa PURSH, Fl. Am. 319 (1814).

A. setacea SCHWEIN. Long. Exp. II, 119 (1825).

A. millefolium var. *nigrescens* E. MEY. Pl. Lab. (1830).

A. lanulosa NUTT. Journ. Acad. Phil. VII, 36 (1834).

A. gracilis and *occidentalis* DC. Prodr. VI, 27 (1837).

Ptarmica borealis DC. Prodr. VI, 27 (1837).

Wats. and Coult., Gray's Man. 6 ed. 289; Britt., Fl. N. J. 147; Webb., Fl. Neb. 145; Cov., Fl. Ark. 197; Upham, Fl. Minn. 84; Mac., Fl. Can. I, 251, 552, *in var.*; Coult., Fl. Colo. 198; Brew. and Wats., Fl. Calif. I, 400; Chap., Fl. S. St. 242; Forbes and Hems., Fl. Sin. 436; Led., Fl. Ross. II, 531; Nym., Fl. Eur.; Hook., Fl. Gt. Brit. 212; Miyabe, Fl. Kur. 241 *in var.*; Herd., Fl. Eur. Russ. 66; Wats., King Exp. 179; Roth., Wheel. Exp. 174, 366; Engl. Hoffmann, Nat. Pflanz. IV, 5, 272; Gray, Syn. Fl. I, 2, 363; Hart., Fl. Scand. I, 5; Coult., Fl. Tex. 239.

All N. hemisphere in old world; Azores to Manchuria and in tropical mt. ranges; Shetland and Arct. Russ. to Caucasus; China; Kuriles and Himalayas; Australasia.

North America: Greenland to Alaska; S. to Fla., Tex. and Mex.

Minn. valley: Throughout; common; hills, fields, edges of woods, shores of lakes.

HERB.: *Sheldon* 360, Madison Lake; *Sheldon* 1187, Lake Benton; *Taylor* 564, Minnesota lake; *Ballard* 178, Jordan, Scott Co.; *Ballard* 735, Waconia; *Taylor* 868, Glenwood; *Taylor* 564, Minnesota lake; *Roberts* 66, Grand Marais; *Kassube* 140, Minneapolis; *Roberts* 67, Poplar river; *Leonard* 26, Duluth; *Leonard* 27, Spring Valley; *Bailey* 159, Vermilion lake; *Roberts* 68, Grand Marais; *Sandberg* 335, Cannon Falls; *Herb. Wickershiem* 80, Idlewild; *Herb. Moyer* 146, Montevideo.

ARTEMISIA LINN. Gen. 644 (1737).

Oligosporus CASS. Bull. Philom. (1817).

Absinthium GAERT. Fruct. II, 393 (1791).

Picrothamnus NUTT. Trans. Phil. Soc. 2, VII, 417 (1841).

Baillon, *Hist. Pl.* VIII, 285; Benth. and Hook., *Gen. Pl.* II, 435; Durand, *Ind. Gen. Phan.* 220; Engl. Hoffmann, *Nat. Pflanz.* IV, 5, 281.

Living species: 200± described; 150— reduced (Durand); N. hemisphere; S. America; Sandwich Islands. Europe, 50; Russia, 85; Russian Europe, 30; North America, 40; Canada, 22–25; E. Sts., 11; Rocky mts., 23; S. Sts., 3; California, 14; Pl. King, 13; Pl. Wheel., 10; W. Tex., 8.

Artemisia frigida WILLD. Spec. III, 1838 (1803).

A. sericea NUTT. Gen. II, 143 (1818).

A. virgata RICH. Frankl. Journ. (1823).

A. frigida var. *gmeliniana* BESS. Hook. Fl. Bor.-Am. I, 321 (1833).

Wats. and Coult., Gray's Man. 6 ed. 291; Webb., Fl. Neb. 144; Mac., Fl. Can. I, 259; Upham, Fl. Minn. 86; Coult., Fl. Colo. 201; Wats., King Exp. 184; Roth., Wheel. Exp. 176, 217; Gray, Syn. Fl. I, 2, 369; Gmel., Fl. Sib. 63; Coult., Fl. Tex. 240.

N. Asia.

North America: Man. and Saskatchewan to Rocky mts. and N. to 58° on Mackenzie; S. to Minn. and Tex.; W. to Idaho, Nev. and N. Mex.

Minn. valley: Throughout; banks and hillsides or on rocky ledges and high ridges.

HERB.: *Sheldon* 1480, Pipestone; *Holzinger* 131, Winona Co.; *Herrick* 170, Minneapolis; *Leiberg* 40, Pipestone Co.; *Sandberg* 340, Red Wing; *MacM.* and *Sheld.* 47, Brainerd.

Artemisia biennis WILLD. Phytogr. 11 (1794).

A. hispanica JACQ. Ic. Rar. 172 (1781) not Lam.

Wats. and Coult., Gray's Man. 6 ed. 291; Britt., Fl. N. J. 149; Webb., Fl. Neb. 144; Upham, Fl. Minn. 85; Mac., Fl. Can. I, 259; Coult., Fl. Colo. 201; Wats., King Exp. 183; Gray, Syn. Fl. I, 2, 370.

Kamstk. and N. India, *fide* Gray.

North America: Hudson Bay to Mackenzie and Pac.

coast; S. to Oregon and S. Calif.; E. to Minn., Neb., Mo., Tenn. and spreading also to N. Y., N. J. and Penn.

Minn. valley: W. districts especially, but probably throughout; sandy or gravelly banks.

HERB.: *Sheldon* 1592, Lake Benton; *Sandberg* 339, Red Wing; *Herb. Moyer* 149, Montevideo.

Artemisia gnaphalodes* (NUTT.) Gen. II, 143 (1818) *emend.

A. integrifolia PURSH, Fl. Am. (1814) *in part.*

A. ludoviciana NUTT. Gen. II, 143 (1818) *pro parte.*

A. ludoviciana NUTT. T. and G. Fl. II, 420 (1841).

A. purshiana, *douglasiana*, *hookeriana* BESS. Abrot. 59 (1834).

A. vulgaris vars. *ludoviciana* and *gnaphalodes* OK. Rev. Gen. I, 309 (1891).

Wats. and Coult., Gray's Man. 6 ed. 291; Mac., Fl. Can. I, 257; Webb., Fl. Neb. 145; Upham, Fl. Minn. 85; Coult., Fl. Colo. 202; Brew. and Wats., Fl. Calif. I, 404; Roth., Wheel. Exp. 176, 366; Wats., King Exp. 183; Gray, Syn. Fl. I, 2, 372; Engl. Hoffmann, Nat. Pflanz. IV, 5, 282; Coult., Fl. Tex. 240.

North America: Red and Milk valleys to Pac. coast and 49° N. lat.; S. in Calif. to Monterey; E. to Saskatchewan, Mich., Minn., Ill., Tex. and Mexico.

Minn. valley: Throughout; dry or sterile banks and along sparsely wooded ridges.

HERB.: *Taylor* 720, Minnesota lake; *Sheldon* 935, Redwood Falls; *Sheldon* 1131, Springfield; *Sheldon* 469, Madison Lake; *Taylor* 1125, Glenwood; *Taylor* 834, Glenwood; *Gedge* 8, Detroit City. The last four are *forma glabrata*; *Sheldon* 1511, Lake Benton; *Taylor* 145, Janesville; *Oestlund* 102, Minneapolis; *Gedge* 9, Moorhead; *Holzinger* 130, Winona; *Sandberg* 338, Cannon Falls; *Herb. Moyer* 147, 148, Montevideo; *Herb. Wickersheim* 81, Ash lake, Lincoln Co.

***Artemisia longifolia* NUTT. Gen. II, 142 (1818).**

? *A. integrifolia* PURSH, Fl. Am. (1814) *in part.*

Wats. and Coult., Gray's Man. 6 ed. 291; Webb., Fl. Neb. 145; Upham, Fl. Minn. 85; Coult., Fl. Colo. 202; Gray, Syn. Fl. I, 2, 372; Mac., Fl. Can. I, 256.

North America: Saskatchewan and Minn. to Neb., Colo. and Mont.

Minn. valley: Reported from S. W. Minn.; banks and ledges; rare.

***Artemisia serrata* NUTT. Gen. II, 142 (1818).**

A. ludoviciana var. *serrata* T. and G. Fl. II, 420 (1841).

Wats. and Coult., Gray's Man. 6 ed. 291; Upham, Fl. Minn. 85; Gray, Syn. Fl. I, 2, 372.

North America: Ill., Minn. and Dak.

Minn. valley: Reported from Coteau des Prairies; moist depressions and near sloughs.

Artemisia dracunculoides PURSH, Fl. Am, 742 (1814).

A. dracunculus PURSH, Fl. Am. 521 (1814).

A. cernua NUTT. Gen. II, 143 (1818).

A. nuttalliana BESS. Hook. Fl. Bor.-Am. I, 326 (1833).

A. inodora HOOK. and ARN. Bot. Beech. 150 (1841).

Wats. and Coult., Gray's Man. 6 ed. 290; Webb., Fl. Neb. 144; Mac., Fl. Can. I, 255, 553; Upham, Fl. Minn. 85; Coult., Fl. Colo. 200; Brew. and Wats., Fl. Calif. I, 404; Roth., Wheel. Exp. 176; Wats., King Exp. 181; Gray, Syn. Fl. I, 2, 369; Coult., Fl. Tex. 240.

North America: Man. to Rockies, Brit. Col. and Peace river reg.; S. to Minn., Colo., Tex., Arizona and Calif. in Sierras; E. to Ill. and Neb

Minn. valley: Throughout; banks of streams, waste places, edges of sandy thickets.

HERB.: *Taylor* 817, Glenwood; *Taylor* 614, Minnesota lake; *Holzinger* 129, Winona; *Sandberg* 336, Cannon Falls; *Herrick* 167, Minneapolis.

Artemisia canadensis MICHX. Fl. N. Am. II, 129 (1803).

A. peucedanifolia JUSS. in herb.

A. campestris PURSH, Fl. Am. 521 (1814).

A. desertorum BESS. Hook. Fl. Bor.-Am. I, 325 (1833) in part.

A. commutata BESS. Dracun. 68 (1835).

? *A. pacifica* NUTT. Trans. Am. Phil. Soc. VII, 399 (1841).

? *A. lewisii* T. and G. Fl. II. 417 (1841) in part.

Wats. and Coult., Gray's Man. 6 ed. 290; Mac., Fl. Can. I, 256; Upham, Fl. Minn. 85; Webb., Fl. Neb. 144; Coult., Fl. Colo. 200; Roth., Wheel. Exp. 176; Cov., Fl. Ark. 197?; Gray, Syn. Fl. I, 2, 368 and 369; Engl. Hoffm., Nat. Pflanz. IV, 5, 282; Coult., Fl. Tex. 240.

N. W. Asia; *fide* Gray.

North America: Can. throughout to 64° N. lat.; S. to Utah, Arizona and N. Mex. in Rockies; to Washington and to Minn., Colo., Neb. and Ark.

Minn. valley: Reported from N. E. and N. edges; sandy shores of lakes and streams.

Artemisia caudata MICHX. Fl. N. Am, II, 129 (1803).

Wats. and Coult., Gray's Man. 6 ed. 290; Britt., Fl. N. J. 148; Upham, Fl. Minn. 85; Mac., Fl. Can. I, 256; Chap., Fl. S. St. 242; Gray, Syn. Fl. I, 2, 368; Coult., Fl. Tex. 239.

North America: Ont. and N. H. to N. J. and N. Car.; W. to Minn., Man. and Mich.; S. to Kan. and Mo.

Minn. valley: Throughout; waste or sandy places; edges of thickets and along streams.

HERB.: *Sheldon* 1392, Lake Benton; *Sheldon* 1046,

Sleepy Eye; *Taylor 1142*, Glenwood; *Herrick 168*, Minnetonka; *Leiberg 38*, Blue Earth Co.; *Herrick 169*, Minneapolis; *Sandberg 337*, Goodhue Co.; *Leiberg 39*, Rock Co.; *Oestlund 103*, Minneapolis.

ERECHTITES RAF. Fl. Lud. 65 (1817).

Neoeis CASS. Bull. Philom. (1820).

Baillon, *Hist. Pl.* VIII, 260 (*sub Senecio*); Benth. and Hook., *Gen. Pl.* II, 443; Durand, *Ind. Gen. Phan.* 221; Engl. Hoffm., *Nat. Pflanz.* IV, 5, 291.

Living species: 12±; tropical and subtropical America; warmer N. Amer.; Australia and New Zealand; introd. in Asia. N. America, 1 sp.

Erechtites hieracifolia (LINN.) RAF. DC. Prodr. VI, 294 (1837).

Senecio hieracifolius LINN. Spec. 866 (1753).

Cineraria canadensis WALT. Fl. Car. 207 (1788).

Erechtites praelonga and *erecta* RAF. Fl. Lud. 65 (1817).

Wats. and Coult., Gray's Man. 6 ed. 295; Britt., Fl. N. J. 149; Mac., Fl. Can. I, 262; Webb., Fl. Neb. 144; Upham, Fl. Minn. 86; Chap., Fl. S. St. 244; Griseb., Fl. W. I; Cov., Fl. Ark. 197; Gray, Syn. Fl. I, 2, 396; Engl. Hoffm., Nat. Pflanz. IV, 5, 291.

S. America; W. Indies to Buenos Ayres; nat. in Mauritius.

North America: Newf. to Saskatchewan; S. to Gulf of Mexico and Fla.

Minn. valley: Forest and S. central districts; clearings and waste places in woodland or thickets.

HERB.: *Sandberg 344*, Red Wing.

SENECIO LINN. Gen. 647 (1737).

Cacalia LINN. Gen. 649 (1737) p. p.

Cineraria LINN. Gen. 957 (1737).

Tephroseris SCHUR. Transsylv. 343 (1866).

Jacobaea THUNB. Prodr. Cap. (1794).

Obaejaca CASS. Dict. XXXV, 270 (1826).

Anecio NECK. Elem. I, 28 (1790).

Herbichia ZAWADSK. Enum. Galic. 198 (1835).

Farobaea SCHR. ex Col. Hort. Rip. App. IV (1828).

Eudorus CASS. Dict. XLI, 166 (1826).

Aspelina CASS. l. c. (1826).

Sclerobasis CASS. Philom. (1818).

Acleia DC. Prodr. VI, 340 (1837).

Hubertia BONG. Voy. Afr. I, 334 (—).

Synarthron CASS. Dict. LI, 457 (1834).

Cissampelopsis MIQ. Ind. Bat. II, 102 (1859).

Bethencourtia CHOIS. Buch. Can. (1819).

Pericallis WEBB. Phyt. Can. 103, 106 (1838).

Mesogramma DC. Prodr. VI, 304 (1837).

- Madaractis** DC. Prodr. VI, 322 (1837).
Doronicum WIGHT. Ic. 1124, 1129 (1843).
Madocarpus WIGHT. Ic. 1152 (1843).
Brachyrhyncos LESS. Syn. Comp. 392 (1832).
Lachanodes DC. Guill. Arch. Bot. II, 332 (1833).
Pladaroxylon ENDL. Gen. 461 (1840) *in part*.
Traversia HOOK. f. Handb. N. Z. Fl. 163 (1867).
Centropappus HOOK. f. Lond. Jour. Bot. VI, 124 (1846).
Carderina CASS. Dict. XXXV, 272 (1826).
Delairea LEM. Ann. Sci. Nat. 3, I, 379 (1844).
Dorobaea CASS. Dict. XLVIII, 453 (1834).
Roldana LLAV. and LEX. Nov. Mex. Veg. II, 10 (1826).
Haplosticha PHILLIP, Linn. XXX, 193 (1856).
Adenotrichia LINDL. Bot. Reg. XIV, t. 1190 (1828).
Danaa COLLA, Mem. Tur. XXXVIII, 27 (1835).
Brachypappus SCH. Bip. Flora. 119 (1855).
Metazanthus MEYEN, Reise I, 356 (1834).
Ligularia CASS. Bull. Philom. (1816).
Hoppea REICH. Ic. Ex. I, 8, 10 (1827).
Erythrochaete S. and Z. Fam. Nat. Jap. II, 64 (1843).
Farfugium LINDL. Gard. Chron. 4 (1857).
Senecillis GAERTN. Fruct. II, 453 (1791).
Pericalia, Psacalium, Pentacalia, Aetheolaena CASS.
 Dict. l. c. (1834).
Pentanthus HOOK. and ARN. Comp. Bot. Mag. I, 32 (1835).
Odontotrichum ZUCC. Baier. Acad. 311 (1832).
Sciadioseris KUNZE, Bot. Zeit. 349 (1851).
Rugelia SCHUTTLEW. Chap. Fl. S. St. 246 (1860).
Syneilesis MAX. Prim. Amur. 165 (1859).
Pithosilum CASS. Dict. XLI, 164 (1834).
Kleinia HAW. Syn. Succ. 312 (1812).
Microchaete BENTH. Hartw. 209 (1841).
Gynoxys DC. Prodr. VI, 326 (1837).
Cladopogon SCH. BIP. Sem. Hamb. (1852).
Pterosenecio SCH. BIP. ex. Dur. Ind. Gen. l. c. (1888).
Willkommia SCHULTZE, ex. Dur. Ind. Gen. l. c. (1888).
Cacalianthemum DILL. Elth. I, 54 (1732).
Notonia DC. Guill. Arch. Bot. II, 518 (1833).
Bedfordia DC. l. c. 332 (1833).
Brachyglottis FORST. Char. Gen. 91 (1776).
Gynura CASS. Dict. XXXIV, 391 (1826).
Crassocephalum MOENCH, Meth. 516 (1794).
Cremocephalum CASS. Dict. XXXIV, 390 (1826).
 ? **Xenocarpus** CASS. l. c. LIX, 108 (1834).
Emilia CASS. l. c. XIV, 405 (1825).
Stilpnogyne DC. Prodr. VI, 293 (1837).
 Baillon, *Hist. Pl.* VIII, 258; Benth. and Hook., *Gen. Pl.* II, 446 *seq.*;
 Durand, *Ind. Gen. Phan.* 221; Engl. Hoffm., *Nat. Pflanz.* IV, 5, 296.
 Living species: 1250+; cosmopolitan. N. America,
 75±; Rocky mts., 21; California, 20; Pl. King, 13; Pl. Wheel.,
 17; E. Sts., 10; W. Tex., 7. Principally S. and W.

Senecio ovatus (WALT.).*Cacalia ovata* WALT. Fl. Car. 196 (1788).*C. tuberosa* NUTT. Gen. II, 138 (1818).*C. paniculata* and *pteryantha* RAF. Ann. Nat. 14 (1820).

Wats. and Coult., Gray's Man. 6 ed. 294; Mac., Fl. Can. I, 268, 555; Upham, Fl. Minn. 86; Webb., Fl. Neb. 144; Chap., Fl. S. St. 244; Mac., Fl. Can. II, 335; Cov., Fl. Ark. 198; Gray, Syn. Fl. I, 2, 396; Coult., Fl. Tex. 242.

North America: Ont. to Lake Huron and Minn.; S. to Neb., Ohio, Ark., Alab., Ga. and Fla.

Minn. valley: Forest district; W. to Cottonwood and Chippewa valleys; damp prairies and openings.

HERB.: *Sheldon* 1187, New Ulm; *Sheldon* 687, Waseca; *Taylor* 565, Minnesota lake; *Sandberg* 346, Cannon Falls.

Senecio atriplicifolius (LINN.) HOOK. Fl. Bor.-Am. I, 332 (1833).*Cacalia atriplicifolia* LINN. Spec. 835 (1753).

Senecio atriplicifolius var. *reniformis* HOOK. Fl. Bor.-Am. I, 332 (1833).

Cacalia gigantea NEES, Ind. Sem. Vratisl. (1842).

Wats. and Coult., Gray's Man. 6 ed. 294; Britt., Fl. N. J. 150; Webb., Fl. Neb. 144; Upham., Fl. Minn. 86; Mac., Fl. Can. I, 268; Chap., Fl. S. St. 244; Cov. Fl. Ark. 198; Gray, Syn. Fl. I, 2, 395.

North America: Ont. to N. J. and Fla.; W. to Minn., Neb. and Mo.

Minn. valley: S. E. edge, Rice Co.; rich woodland and moist banks or shores.

HERB.: *Sandberg* 345, Goodhue Co.

Senecio reniformis (MUHL.).*Cacalia reniformis* MUHL. Willd. Spec. III, 1735 (1803).

Wats. and Coult., Gray's Man. 6 ed. 294; Britt., Fl. N. J. 150; Chap., Fl. S. St. 244; Upham, Fl. Minn. 86; Gray, Syn. Fl. I, 2, 395.

North America: N. J. to N. Car. and Tenn.; W. to Ills. and Minn.

Minn. valley: S. E. edge; rare; rich, deep woods.

HERB.: *Leonard* 28, Sumner.

Senecio lugens RICH. Frankl. Jour. 2 ed. 31 (1825).*S. lugens* vars. *hookeri* and *parryi* EAT. King. Exp. 188 (1871).*Cineraria pratensis* HERD. Pl. Radd. II, 127 (—).*Cacalia lugens* MACM. MSS. (1891).

Wats. and Coult., Gray's Man. 6 ed. 294; Webb., Fl. Neb. 144; Upham, Fl. Minn. 87; Mac., Fl. Can. I, 263, 554; Coult., Fl. Colo. 209; Brew. and Wats., Fl. Calif. I, 413; Led., Fl. Ross. II, 644; Wats., King Exp. 188; Roth., Wheel. Exp. 177; Gray, Syn. Fl. I, 2, 388; Coult., Fl. Tex. 242.

Circumpolar.

North America: Rocky mts., Fraser river, 66° N. lat.

to Kotzebue Sound and Bon Esperance, Alaska; S. in mts. to Mexico; W. to Calif. and Pac. coast; E. to Minn., Iowa, Neb., Dakota.

Minn. valley: W. districts; swampy or moist places in prairie, edges of lakes.

HERB.: *Leiberg* 43, "Minnesota"; *Herb. Wickersheim* 84, Idlewild, Lincoln Co.; *Herb. Moyer* 153, Granite Falls.

Senecio integerrimus NUTT. Gen. II, 165 (1818).

Cacalia integerrima MACM. MSS. (1891).

Gray, Syn. Fl. I, 2, 388; Mac., Fl. Can. I, 554; Upham, Fl. Minn. 87.

North America: Dak. and Minn. to Saskatchewan.

Minn. valley: Reported from S. W. district; doubtful; prairies and ridges.

Senecio tomentosus MICHX. Fl. Am. II, 119 (1803).

Cineraria heterophylla PURSH, Fl. Am. 528 (1814).

Senecio integrifolius var. *heterophyllus* NUTT. Gen. II, 165 (1818).

S. aureus UPHAM, Fl. Minn. 87 (1883) *as to specs. Kassube*.

Wats. and Coult., Gray's Man. 6 ed. 293; Gray, Syn. Fl. I, 2, 390; Britt., Fl. N. J. 150; Chap., Fl. S. St. 245.

North America: N. J., Del. and Penn. to Fla.; W. to Minn. and Ark.

Minn. valley: N. E. edge; open and moist places.

HERB.: *Kassube* 279, Minneapolis; 280, Minnehaha.

Senecio aureus LINN. Spec. 870 (1753).

S. gracilis PURSH, Fl. Am. 529 (1814).

S. fastigiatus SCHWEIN. Ell. Sk. II, 331 (1824).

Cacalia aurea MACM. MSS. (1891).

Wats. and Coult., Gray's Man. 6 ed. 293; Britt., Fl. N. J. 150; Webb., Fl. Neb. 144; Upham, Fl. Minn. 87; Chap. Fl. S. St. 245; Brew. and Wats., Fl. Calif. I, 411; Coult., Fl. Colo. 210; Wats., King Exp. 189; Roth., Wheel. Exp. 366?; Gray, Syn. Fl. I, 2, 391; Cov., Fl. Ark. 197; Coult., Fl. Tex. 242.

North America: Newf.?, N. S., N. Br., Rocky mts. and Pac. coast to 49° N. lat.; S. to N. J. and N. Car., and W. to Nev. and Pac. coast of California.

Minn. valley: Throughout; moist, marshy or swampy places; abundant.

HERB.: *Ballard* 18, Chaska; *Taylor* 47, Elysian; *Ballard* 475, Prior's lake, Scott Co.; *Sheldon* 309, Madison Lake, Blue Earth Co.; *Herrick* 173, Minneapolis; *Sandberg* 348, Center City; *Kassube* 142, Minneapolis; *Sandberg* 349, Tower; *Herb. Sheld.* 1808, Minneapolis; *Herb. Wickersheim* 83, Idlewild, Lincoln Co.; *Herb. Moyer* 152, Montevideo.

Senecio aureus LINN. var. **pauperculus** (MICHX.).

S. pauperculus MICHX. Fl. N. Am. II, 120 (1803).

S. balsamitae MUHL. Willd. Spec. III, 1999 (1804).

S. plattensis NUTT. Trans. Am. Phil. Soc. VII, 413 (1841).

S. aureus var. *balsamitae* T. and G. Fl. II, 443 (1841).

Cacalia aurea var. *paupercula* MACM. MSS. (1891).

Wats. and Coult., Gray's Man. 6 ed. 293; Britt., Fl. N. J. 150; Webb., Fl. Neb. 144; Mac., Fl. Can. I, 265, 554; Chap., Fl. S. St. 245; Upham, Fl. Minn. 87; Brew. and Wats., Fl. Calif. I, 412; Gray, Syn. Fl. I, 2, 391; Gray, Syn. Suppl. 454.

North America: Anticosti, N. S., N. Br., Q., Ont. to Brit. Col. and Selkirk mts.; S. to N. J., Va. and Tenn.; W. to Neb., Tex., Colo. and Oregon.

Minn. valley: Throughout; high dry knolls and rocky ledges; headlands and ridges.

HERB.: *Sheldon* 1479, Pipestone City; *Ballard* 142, Chaska; *Ballard* 518, Prior's lake, Scott Co.; *Taylor* 229, Janesville; *Sheldon* 148, Madison Lake, Blue Earth Co.; *Taylor* 1156, Glenwood; *Herrick* 174, St. Louis river; *Arthur* 50, Vermilion lake; *Sheldon* 1399, Lake Benton.

Senecio aureus LINN. var. **obovatus** (MUHL.) T. and G. Fl. II, 442 (1841).

S. obovatus MUHL. Willd. Spec. III, 1999 (1804).

S. aureus var. *gracilis* HOOK. Fl. Bor.-Am. I, 333 (1833).

S. elliotii T. and G. Fl. II, 443 (1841).

Cacalia aurea var. *obovata* MACM. MSS. (1891).

Wats. and Coult., Gray's Man. 6 ed. 293; Britt., Fl. N. J. 150; Mac., Fl. Can. I, 265; Upham, Fl. Minn. 87; Gray, Syn. Fl. I, 2, 391; Coult., Fl. Tex. 242.

North America: N. S. to Brit. Col.; S. to Minn., Ind. and Georgia.

Minn. valley: Throughout forest and N. W. district; drier places and damp prairies.

HERB.: *Taylor* 761, Glenwood; *Kassube* 143, Minneapolis.

Senecio palustris (LINN.) HOOK. Fl. Bor.-Am. I, 334 (1833).

Cineraria palustris LINN. Spec. ed. 2, 1243 (1762).

C. congesta R. Br. Parr. Voy. (1823).

Senecio palustris var. *congestus* HOOK. Fl. Bor.-Am. I, 334 (1833).

Wats. and Coult., Gray's Man. 6 ed. 293; Mac., Fl. Can. 263; Upham, Fl. Minn. 86; Mac., Fl. Can. I, 554; Hook., Fl. Gt. Brit. 219; Trautv., Fl. Sib. 75; Gray, Syn. Fl. I, 2, 394; Hart., Fl. Scand. I, 9.

N. Europe to France and Austria; N. Asia.

North America: N. S. and Greenland to Saskatchewan and far N. to Kotzebue Sound and Wainright Inlet, Alaska; S. to Minn., Dak. and Iowa.

Minn. valley: Forest district and N. W. districts; edges of swamps, streams or lakes.

HERB.: *Ballard* 519, Prior's lake, Scott Co.; *Ballard* 499, Scott Co.; *Taylor* 383, Janesville; *Taylor* 316, Janesville; *Sheldon* 106½, Elysian; *Herrick* 172, Sandy lake; *Sandberg* 347, Center City; *Herb. Moyer* 151, Stevens lake, Chippewa Co.

CNICUS LINN. Gen. 633 (1737).

Picnomon ADANS. Fam. II, 116 (1763).

Breca LESS. Syn. Comp. 9 (1832).

Onopordum LINN. Gen. 927 (1737).

Acanos ADANS. Fam. II, 116 (1763).

Lamyra, Platyrhaphium, Ptilostemon, Orthocentron, Lophiolepis, Eriolepis, Notobasis CASS. Dict. XXV-XLIV (1826).

Echenais CASS. Bull. Philom. (1818).

Spanioptilon LESS. Comp. Syn. 10 (1832).

Xylanthena, Cephalonoplos NECK. Elem. 67, 68 (1790).

Chamaepeuce DC. Prodr. VI, 657 (1837).

Ancathia DC. Guill. Arch. Bot. II, 331 (1833).

Picnocomon and **Acarna** VAILL. Acad. Par. (1718).

Epitrachys K. KOCH, Linn. XXIV, 396 (1850).

Ornitrophis CASS. ex Dur. l. c. (1888).

Cirsium DC. Fl. Fr. IV, 110 (1805).

Baillon, *Hist. Pl.* VIII, 5 (sub *Carduus*); Benth. and Hook., *Gen. Pl.* II, 468; Durand, *Ind. Gen. Phan.* 225.

Living species: 175±; Europe; Asia; Africa; N. and S. America; extra-tropical. Introduced elsewhere. Europe, 65; Russia, 55; Russian Europe, 22; North America, 35; Rocky mts., 12; Canada, 13; E. Sts., 7; S. Sts., 9; California, 12-14; Pl. King, 5; Pl. Wheel., 8; W. Tex., 6.

Cnicus odoratus (MUHL.) B. S. P. Cat. N. Y. (1888).

Carduus odoratus MUHL. Cat. 70 (1813).

Carduus pumilus and var. *hystrix* NUTT. Gen. II, 130 (1818).

Cirsium pumilum SPRENG. Syst. III, 375 (1826).

Cnicus pumilus TORR. Compend. 282 (1826).

Wats. and Coult., Gray's Man. 6 ed. 296; Britt., Fl. N. J. 151; Mac., Fl. Can. I, 269; Upham, Fl. Minn. 88; Gray, Syn. Fl. I, 2, 401.

North America: Maine to Penn. and N. J.; W. to Man. and Minn.

Minn. valley: N. E., N. and N. W. districts; dry fields or sparsely wooded ridges.

HERB.: *Ballard* 574, Prior's lake, Scott Co.; *Taylor* 1013, Glenwood; *Sandberg* 351, Cannon Falls.

Cnicus muticus (MICHX.) PURSH, Fl. Am. 506 (1814).

Cirsium muticum MICHX. Fl. Am. II, 89 (1803).

Carduus muticus and *glaber* (?) NUTT. Gen. II, 129 (1818).

Cnicus glutinosus BIGEL. Fl. Bost. 2 ed. 291 (1824).

Cirsium bigelovii DC. Prodr. VI, 640 (1837).

Wats. and Coult., Gray's Man. 6 ed. 296; Britt., Fl. N. J. 151; Upham,

Fl. Minn. 88; Chap., Fl. S. St. 247; Mac., Fl. Can. I, 270; Gray, Syn. Fl. I, 2, 405.

North America: Newf., Anticosti, N. S., N. Br. to Saskatchewan and Minn.; S. to N. Eng., N. J., Va., Fla. and La.

Minn. valley: Forest district; swamps and near lake shores.

HERB.: *Bailey 33*, Vermilion lake; *Sandberg 350*, Goodhue Co.; *Taylor 700*, Minnesota lake.

Cnicus discolor MUHL. Willd Spec. III, 1670 (1803).

Carduus discolor NUTT. Gen. II, 130 (1818).

Cirsium discolor SPRENG. Syst. III, 373 (1826).

Cnicus altissimus var. *discolor* GRAY, Proc. Am. Acad. XIX, 57 (1883).

Wats. and Coult., Gray's Man. 6 ed. 296; Chap., Fl. S. St. 247; Mac., Fl. Can. I, 270; Webb., Fl. Neb. 144; Upham, Fl. Minn. 88; Britt., Fl. N. J. 151; Cov., Fl. Ark. 198; Gray, Syn. Fl. I, 2, 404.

North America: N. Eng. and Ont. to Minn. and Neb.; S. to N. J., Ill., Mo., Ark. and Va.

Minn. valley: N. districts; meadows, fields, copses and low thickets.

HERB.: *Ballard 761*, Waconia; *Taylor 741*, Glenwood; *Herrick 175*, Minneapolis; *Oestlund 104*, Minneapolis; *Kassube 144*, Minneapolis.

Cnicus altissimus (LINN.) WILLD. Spec. III, 1671 (1803).

Carduus altissimus LINN. Spec. 824 (1753).

Cirsium diversifolium DC. Prodr. VI, 640 (1837).

Wats. and Coult., Gray's Man. 6 ed. 296; Britt., Fl. N. J. 151, *in var.*; Webb., Fl. Neb. 144; Upham, Fl. Minn. 88; Mac., Fl. Can. I, 270 *in var.*; Coult., Fl. Colo. 214; Chap., Fl. S. St. 247; Cov., Fl. Ark. 198; Gray, Syn. Fl. I, 2, 404; Coult., Fl. Tex. 243.

North America: Mass. to Minn. and Neb.; S. to Miss., N. Car., Fla., Ark. and Tex.

Minn. valley: S. central, S. W., W. and N. W. districts; fields and borders of thickets or streams.

HERB.: *Taylor 1026*, Glenwood; *Taylor 728*, Glenwood; *Herb. Wickersheim 85*, Ash lake, Lincoln Co.; *Herb. Moyer 154*, Chippewa river, near Montevideo.

Cnicus undulatus (NUTT.) GRAY, Proc. Am. Acad. X, 42 (1874).

Carduus undulatus NUTT. Gen. II, 130 (1818).

C. discolor HOOK. Fl. Bor.-Am. I (1833) *in part.*

C. douglasii DC. Prodr. VI, 643 (1837).

C. hookerianum HOOK. Lond. Journ. Bot. VI, 253 (1854).

Wats. and Coult., Gray's Man. 6 ed. 296; Webb., Fl. Neb. 144; Mac., Fl. Can. I, 269; Upham, Fl. Minn. 88; Coult., Fl. Colo. 214; Brew. and

Wats., Fl. Calif. I, 418; Wats., King Exp. 204, 422; Roth., Wheel. Exp. 179; Gray, Syn. Fl. I, 2, 403; Coult., Fl. Tex. 243.

North America: Man. to Rockies, N. W. T. and Brit. Col.; W. to limit of prairies; S. to Oregon, Gt. lakes, Minn., Kan. and N. Mex.

Minn valley: Reported from plains of W. district; doubtful or rare; fields and prairies.

HERB.: ?*Roberts 70*, Grand Marais.

LACTUCA LINN. Gen. 622 (1737).

Brachyramphus DC. Prodr. VII, 176 (1838-39).

Phaenioxopus CASS. Dict. XXXIX, 391 (1826).

Phaenopus DC. Prodr. VII, 176 (1838-39).

Cyanoseris SCHUR. Transsylv. 369 (1866).

Pyrhopappus A. RICH. Abyss. Fl. I, 463 (1847).

Cicerbita WALLR. Sched. Crit. Halle, 433 (1822).

Mulgedium CASS. Dict. XXXIII, 296 (1826).

Galathenium NUTT. Trans. Phil. Soc. 2, VII, 442 (1841).

Agathysus DON, Edin. Phil. Journ. 310 (1828-29).

Melanoseris DECAISNE, Jacqm. Voy. Bot. 101 (1844).

Lactucopsis SCH. BIP. Vis. and Panc. Fl. Serb. II, 5 (1870).

Cephalorhyncus BOISS. Diag. Or. IV, 28 (1859).

Dubyaea DC. Prodr. VII, 247 (1838-39).

Steptoramphus BUNGE, Rel. Lehm. 205 (1851).

Mycelis and **Ixeris** CASS. Dict. XXIV, 49 (1826).

Chorisma DON, Edin. Phil. Jour. 308 (1828-29).

Chorisis DC. Prodr. VII, 177 (1838-39).

Baillon, *Hist. Pl.* VIII, 115; Benth. and Hook., *Gen. Pl.* II, 524; Durand, *Ind. Gen. Phan.* 235.

Living species: 75-100; Europe; Asia; Africa; N. America. Europe, 22; Russia, 17; Russian Europe, 10; N. America, 9; Canada, 7; S. Sts., 1; Rocky mts., 3; California, 1; E. Sts., 8; Pl. Wheel., 1; Pl. King, 1; W. Tex., 4.

Lactuca spicata (LAM.) HITCHCOCK, Fl. Ames 506 (1891).

Sonchus spicata LAM. Enc. Meth. III, 401 (1786).

S. floridanus AIT. Hort. Kew. III, 116 (1789).

S. biennis MOENCH, Meth. 545 (1794).

S. leucophaeus WILLD. Spec. III, 1520 (1803).

S. acuminatus BIGEL. Fl. Bost. 2 ed. 290 (1824).

S. pallidus TORR. Compend. 279 (1826).

S. multiflorus DESF. Cat. Par. (1829).

Agathysus leucophaeum BECK, Bot. 170 (1833).

Mulgedium leucophaeum DC. Prodr. VII, 249 (1838).

Lactuca leucophaeum GRAY, Proc. Am. Acad. XIX, 73 (1872).

Wats. and Coult., Gray's Man. 6 ed. 305; Britt., Fl. N. J. 154; Mac., Fl. Can. I, 281; Coult., Fl. Colo. 224; Chap., Fl. S. St. 253; Brew. and Wats., Fl. Calif. I, 442; Gray, Syn. Fl. I, 2, 444.

North America: Newf., Anticosti, N. Br., U. S., Q.,

Ont. to Brit. Col. and coast region; S. to Oregon and N. Calif.; E. to Minn., N. J., Iowa, Tenn. and N. Car.

Minn. valley: Forest district and W. to Cottonwood valley; low grounds near thickets or along streams.

HERB.: *Ballard* 645, Chaska; *Sheldon* 1184, New Ulm; *Sheldon* 894, Sleepy Eye; *Bailey* 457, Mud lake; *Roberts* 71, Stewart river; *Sandberg* 360, Red Wing; *Oestlund* 105, Minneapolis.

***Lactuca floridana* (LINN.) GAERTN.** Fruct. II, 262 (1791).

Sonchus floridanus LINN. Spec. II, 795 (1753).

Mulgedium lyratum CASS. Dict. XXXIII, 297 (1826).

Mulgedium floridanum DC. Prodr. VII, 249 (1839).

Galathenium floridanum NUTT. Trans. Am. Phil. Soc. VII, 441 (1841).

Wats. and Coult., Gray's Man. 6 ed. 304; Britt., Fl. N. J. 154; Webb., Fl. Neb. 143; Mac., Fl. Can. I, 281; Upham, Fl. Minn. 91; Chap., Fl. S. St. 253; Cov., Fl. Ark. 199; Gray, Syn. Fl. I, 2, 443; Coult., Fl. Tex. 249.

North America: Detroit river and Minn. to N. J., Penn., Carolinas and Fla.; W. to Ills., Neb. and Ark.

Minn. valley: Reported from N. E. and E. edges; local or doubtful; borders of woods or thickets.

***Lactuca pulchella* (PURSH) DC.** Prodr. VII, 134 (1838).

Sonchus pulchellus PURSH, Fl. Am. 502 (1814).

Lactuca integrifolia NUTT. Gen. II, (1818).

Sonchus sibiricus RICH. Hook. Fl. Bor.-Am. I, 293 (1833).

Mulgedium pulchellum T. and G. Fl. II, 497 (1841).

M. heterophyllum NUTT. Trans. Am. Phil. Soc. VII, 441 (1841).

Wats. and Coult., Gray's Man. 6 ed. 304; Webb., Fl. Neb. 143; Upham, Fl. Minn. 91; Brew. and Wats., Fl. Calif. I, 442; Coult., Fl. Colo. 223; Roth., Wheel. Exp. 182; Wats., King Exp. 208, 422; Gray, Syn. Fl. I, 2, 443.

North America: L. Huron throughout C. Can. to 66° N. lat., Mackenzie river reg. and Alaska; S. to N. Mex. and Calif.; E. to Neb., Minn. and Mich.

Minn. valley: Throughout; local or infrequent; prairies and edges of woods.

HERB.: *Sheldon* 491, Madison Lake; *Ballard* 682, Waconia; *Taylor* 415, Janesville; *Taylor* 1040, Glenwood; *Taylor* 883, Glenwood; *Sheldon* 1274, Lake Benton; *Juni* 9, Lake Carlos; *Bailey* 4, Vermilion lake.

***Lactuca ludoviciana* (NUTT.) DC.** Prodr. VII, 141 (1838).

Sonchus ludovicianus NUTT. Gen. II, 125 (1818).

Galathenium ludovicianum NUTT. Trans. Am. Phil. Soc. VII, 433 (1841).

Wats. and Coult., Gray's Man. 6 ed. 304; Gray, Syn. Fl. I, 2, 443; Coult., Fl. Colo. 223; Webb., Fl. Neb. 143; Upham, Minn. Suppl. 86; Coult., Fl. Tex. 249.

North America: Minn. and Dak. to Iowa, Neb., Ark. and Tex.

Minn. valley: S. W. district; local?; thicket edges and borders of woods, or in openings.

HERB.: *Sheldon* 894, Sleepy Eye.

***Lactuca hirsuta* MUHL. Cat. (1813).**

L. sanguinea BIGEL. Fl. Bost. 2 ed. 287 (1824).

L. sagittaeifolia ELL. Sk. II, 253 (1824).

L. elongata var. *sanguinea* and *albiflora* T. and G. Fl. II, 496 (1841).

Galathenium sanguineum and *floridanum* NUTT. Trans. Am. Phil. Soc. VII, 443 (1841).

Lactuca canadensis GRAY, Man. 5 ed. (1867).

Wats. and Coult., Gray's Man. 6 ed. 304; Mac., Fl. Can. I, 280; Britt., Fl. N. J. 154; Upham, Fl. Minn. 91; Cov., Fl. Ark. 199; Gray, Syn. Fl. I, 2, 442; Coult., Fl. Tex. 249.

North America: Ont. to E. Mass., N. J. and La.; W. to Minn., Ark. and Tex.

Minn. valley: Forest and W. district; doubtless N. W.; borders of woods and thickets.

HERB.: *Sheldon* 1304, Lake Benton.

***Lactuca canadensis* LINN. Spec. 796 (1753).**

L. caroliniana WALT. Fl. Car. 193 (1788).

L. longifolia MICHX. Fl. N. Am. II, 85 (1803).

L. elongata MUHL. Willd. Spec. III, 1523 (1803).

Sonchus pallidus WILLD. Spec. III, 1521 (1803).

Galathenium elongatum NUTT. Trans. Am. Phil. Soc. VII, 443 (1841).

Wats. and Coult., Gray's Man. 6 ed. 304; Britt., Fl. N. J. 154; Webb., Fl. Neb. 143; Mac., Fl. Can. I, 280; Upham, Fl. Minn. 91; Cov., Fl. Ark. 199; Gray, Syn. Fl. I, 2, 442.

North America: Anticosti to Assiniboia and Saskatchewan; S. to N. Eng. and N. J. to Ga.; W. to Minn., Neb. and Ark.

Minn. valley: Throughout; borders of thickets and open places in woods.

HERB.: *Ballard* 616, Chaska; *Ballard* 744, Waconia; *Sheldon* 1010, Sleepy Eye; *Ballard* 580, Rice lake, Scott Co.; *Taylor* 1021, Glenwood; *Sheldon* 1181, New Ulm; *Bailey* 196, Vermilion lake; *Kassube* 149, Minneapolis; *Sandberg* 359, Cannon Falls.

TARAXACUM HALL. Stirp. Helv. I, 23 (1742).

Leontodon ADANS. Fam. II, 112 (1763).

Lasiopus DON, Sweet. Brit. Fl. Gard. 2, 346 (1836).

? **Caramanaca** TINEO, Pl. Rar. Sic. (1846).

Dens Leonis TOURN. Inst. 468 (1700).

Baillon, *Hist. Pl.* VIII, 110 (*sub Leontodon*); Benth. and Hook., *Gen. Pl.* II, 522; Durand, *Ind. Gen. Phan.* 235.

Living species: 40 described; 10 reduced; N. hemisphere and a few introduced or rarely indigenous in S. hemisphere. Russia, 14; Europe, 10; Russian Europe, 9; North America, 1-4; Pl. King, 3 descr.

Taraxacum taraxacum (LINN.) MACM. Torr. Bull. XIX, 1891).

Leontodon taraxacum LINN. Spec. (1753).

Taraxacum officinale WEBB. Prim. Fl. Holst. 56 (1780).

T. dens-leonis DESF. Fl. Atl. II, 228 (1800).

Wats. and Coult., Gray's Man. 6 ed. 303; Britt., Fl. N. J. 154; Upham, Fl. Minn. 91; Chap., Fl. S. St. 252; Coult., Fl. Colo. 222; Mac., Fl. Can. I, 279; Brew. and Wats., Fl. Calif. I, 439; Forbes and Hems., Fl. Sin. 478; Led., Fl. Ross. II, 812; Hook., Fl. Gt. Brit. 240; Nym., Fl. Eur.; Mac., Fl. Can. I, 558 *in var.*; Griseb., Fl. W. I; Herd., Fl. Eur. Russ. 78; Wats., King Exp. 206; Cov., Fl. Ark. 198; Gray, Syn. Fl. I, 2, 440; Hart., Fl. Scand. I, 58; Coult., Fl. Tex. 248.

All Europe and N. Asia to China and in temperate stations in S. hemisphere (probably adventive).

North America: Canada throughout, to Alaska, Baffins bay and Greenland; throughout U. S. and in Mex.; forms E. of Minn. are probably introduced from Europe.

Minn. valley: Throughout; fields, banks, roadsides and grassy places.

HERB.: *Taylor* 82, Elysian; *Taylor* 184, Janesville; *Sandberg* 358, Red Wing; *Kassube* 148, Minneapolis; *Hammond* 23, Lake City; *Herb. Sheld.* 1791, Minneapolis; *Herb. Wickersheim* 88, Idlewild, Lincoln Co.

NOTHOCALAIS GREENE, Bull. Acad. Calif. II, 54 (1886).

Troximon AUCT. *in part.*

Eutroximon GRAY, (Sect.) Syn. Fl. I, 2, 437 (1886) *p. p.*

North America: 4-5; California and Pac. coast region; 1 extending eastward.

Nothocalais cuspidatum (PURSH) GREENE, Bull. Calif. Acad. II, 54 (1886).

Troximon cuspidatum PURSH, Fl. Am. 472 (1814).

T. marginatum NUTT. Gen. II, 128 (1818).

Wats. and Coult., Gray's Man. 6 ed. 302; Mac., Fl. Can. I, 277; Upham, Fl. Minn. 89; Webb., Fl. Neb. 143; Coult., Fl. Colo. 221; Gray, Syn. Fl. I, 2, 437.

North America: N. W. T. to Dak. and Neb.; E. to Saskatchewan, Minn., Wisc. and Ill.

Minn. valley: Throughout; especially in prairie district; plains and hills or sunny banks.

HERB.: *Herrick* 178, Minneapolis; *Sandberg* 352, Welsh, Goodhue Co.; *Herb. Sheld.* 1809, Minneapolis; *Herb. Wickersheim* 86, Idlewild; *Herb. Moyer* 156, Montevideo.

AGOSERIS RAF. Fl. Lud. 58 (1817).

Macrorhyncus LESS. Syn. Comp. 139 (1832).

Ammogeton SCHRAD. Cat. Goett. 1 (1833).

Cryptopleura and **Stylopappus** NUTT. Trans. Phil. Soc. ser. 2, VII, 431 (1841).

Troximon AUCT. in part.

Baillon, *Hist. Pl.* VIII, 110 (sub *Leontodon* Linn.); Benth. and Hook., *Gen. Pl.* II, 522; Durand, *Ind. Gen. Phan.* 234; O. Kuntze, *Rev. Gen.* I, 304.

Living species: 23± (Greene, *Pittonia* II, 176); N. America and Chile; all in western and Pac. coast regions.

Agoseris glauca (PURSH) GREENE, *Pittonia* II, 176 (1891).

Troximon glaucum PURSH, Fl. Am. 495, 505 (1814).

Macrorhyncus glaucus EAT. Bot. King Exp. 204 (1871).

Wats. and Coult., Gray's Man. 6 ed. 303; Mac., Fl. Can. I, 277; Upham, Fl. Minn. 89; Coult., Fl. Colo. 221; Brew. and Wats., Fl. Calif. I, 437; Gray, Syn. Fl. I, 2, 437.

North America: Man. and Saskatchewan to Pac.; S. in Sierras to Calif., Utah, Nev. and E. to Minn. and Neb.

Minn. valley: W. edge; infrequent; plains and high ridges or headlands.

HERB.: *Sheldon* 1278, Lake Benton.

ADOPOGON NECK. Elem. I, 55 (1790).

Krigia SCHREB. Gen. 532 (1791).

Cynthia DON, Edin. Phil. Journ. 309 (1828-29).

Luthera SCH. BIP. Linn. X, 275 (1836).

Baillon, *Hist. Pl.* VIII, 20 (sub *Cichorium*); Benth. and Hook., *Gen. Pl.* II, 507; O. Kuntze, *Rev. Gen.* I, 304; Durand, *Ind. Gen. Phan.* 232.

Living species: 4-5; N. America; S. Sts., 4; E. Sts., 3; Canada, 2; Rocky mts., 1; W. Tex., 3.

Adopogon virginicum (LINN.) OK. Rev. Gen. I, 304 (1891).

Tragopogon virginicum LINN. Spec. 789 (1753).

Hyoseris biflora WALT. Fl. Car. 194 (1788).

H. amplexicaulis MICHX. Fl. N. Am. II, 87 (1803).

H. prenanthoides WILLD. Spec. III, 1618 (1803).

Cynthia virginica DON, Edin. Phil. Jour. XII, 305 (1828-29).

Krigia amplexicaulis NUTT. Gen. II, 127 (1818).

C. amplexicaulis BECK, Bot. 168 (1833).

Cynthia griffithii NUTT. Jour. Acad. Phil. VII, 69 (1834).

Wats. and Coult., Gray's Man. 6 ed. 298; Britt., Fl. N. J. 152; Mac., Fl. Can. I, 273; Upham, Fl. Minn. 89; Coult., Fl. Colo. 215; Chap., Fl. S. St. 249; Cov., Fl. Ark. 198; Gray, Syn. Fl. I, 2, 412.

North America: Ont. to S. Man., Dak. and Colo.; S. to N. Y., N. J., Conn., Ga. and W. to Iowa, Minn. and Ark.

Minn. valley: Throughout, particularly in the prairie districts; grassy places or sunny banks.

HERB.: *Sheldon* 626, Wilton, Waseca Co.; *Sheldon* 534, Waseca; *Herrick* 176, Minneapolis; *Holzinger* 133, Winona Co.; *Herrick* 177, Minneapolis; *Kassube* 145, Minneapolis.

LYGODESMIA DON, Edin. Phil. Jour. 311 (1828-29).

Erythremia NUTT. Trans. Phil. Soc. 2, VII, 455 (1841).

Baillon, *Hist. Pl.* VIII, 113 (*sub Scorzonera*); Benth. and Hook., *Gen. Pl.* II, 530; Durand, *Ind. Gen. Phan.* 235.

Living species: 5-6; N. America; especially S. W. Rocky mts., 3; E. Tex. and Fla., 1; California, 2; S. Sts., 1; E. Sts., 1; Pl. King, 2; W. Tex., 3.

Lygodesmia juncea (PURSH) DON, Hook. Fl. Bor.-Am. I, 295 (1833).

Prenanthes juncea PURSH, Fl. Am. 498 (1814).

Wats. and Coult., Gray's Man. 6 ed. 302; Webb., Fl. Neb. 143; Coult., Fl. Colo. 220; Mac., Fl. Can. I, 283; Upham, Fl. Minn. 90; Brew. and Wats., Fl. Calif. I, 441; Wats., King Exp. 200; Gray, Syn. Fl. I, 2, 435; Coult., Fl. Tex. 248.

North America: Saskatchewan and Man. to Rockies, 49° N. lat.; S. to Wisc., Minn., Neb., N. Mex. and Nev.

Minn. valley: Throughout; sandy and waste places or on gravelly banks.

HERB.: *Sheldon* 950, Redwood Falls; *Sheldon* 1014, Sleepy Eye; *Sheldon* 1510, Lake Benton; *Sheldon* 703, Minneapolis; *Taylor* 869, Glenwood; *Ballard* 255, Jordan, Scott Co.; *Ballard* 634, Chaska; *Sandberg* 357, Vasa; *Herrick* 182, Minneapolis; *MacM.* and *Sheld.* 48, Brainerd; *Herb. Moyer* 155, Minnesota valley, near Montevideo.

PRENANTHES LINN. Gen. 609 (1737) *p. p.* BENTH. l. c. (1873).

Nabalus CASS. Dict. XXXIV, 94 (1836).

Harpalyce DON, Edin. Phil. Jour. (1828-29).

Esopon RAF. Fl. Lud. 146 (1817).

Baillon, *Hist. Pl.* VIII, 116 (*sub Lactuca*); Benth. and Hook., *Gen. Pl.* II, 527; Durand, *Ind. Gen. Phan.* 235.

Living species: 20±; S. Europe to India and Japan; Canary Isls.; N. America. Europe, 6; rest mostly American; S. Sts., 7; E. Sts., 9; Rocky mts., 2; Canada, 5; Russia, 4; Russian Europe, 1-2.

Prenanthes serpentaria PURSH, Fl. Am. 499 (1814).

? *Nabalus glaucus* RAF. Fl. Lud. 57 (1817).

N. fraseri and *trilobatus* DC. Prodr. VII, 242 (1837-1839).

Wats. and Coult., Gray's Man. 6 ed. 301; Britt., Fl. N. J. 155; Mac., Fl. Can. I, 282, 559; Upham, Fl. Minn. 90; Chap., Fl. S. St. 251; Gray, Syn. Fl. I, 2, 434.

North America: Newf., Anticosti, Q., Ont. to Minn.; S. to N. Eng., N. J. and Fla.

Minn. valley: Reported from N. E. and N. edges borders of woods and thickets, or shady banks.

Prenanthes alba LINN. Spec. (1753)

P. rubicunda WILLD. Spec. III, 2537 (1804).

P. suavis SALISB. Parad. Lond. 85 (1806-1807).

P. miamensis, *ovata* and *proteophylla* RIDD. Syn. W. Pl. (1835) *in part*.

Nabalus albus HOOK. Fl. Bor.-Am. II, 294 (1840).

Wats. and Coult., Gray's Man. 6 ed. 301; Britt., Fl. N. J. 155; Upham, Fl. Minn. 90; Chap., Fl. S. St. 250; Mac., Fl. Can. I, 282, 559; Cov., Fl. Ark. 199; Gray, Syn. Fl. I, 2, 434.

North America: Newf., Anticosti to Saskatchewan; S. to Ga., Ill. and Ark.

Minn. valley: Throughout; borders of thickets and on shaded river banks.

HERB. *Sheldon* 1156, New Ulm; *Taylor* 1094, Glenwood; *Taylor* 1121, Glenwood; *Herrick* 179, Minneapolis; *Winchell* 11, Richfield; *Herrick* 180, Minneapolis; *Bailey* 481, Agate bay; *Bailey* 399, Mud lake; *Kassube* 147, Minneapolis; *Herrick* 181, Minneapolis; *Sandberg* 354, Cannon Falls; *Herb. Sheld.* 1812, Minneapolis.

Prenanthes aspera MICHX. Fl. N. Am. II, 84 (1803).

P. illinoensis PERS. Syn. II, 366 (1807).

Chondrilla illinoensis POIR. Suppl. II, 331 (1811).

Nabalus illinoensis DC. Prodr. VII, 242 (1837-1839).

N. asper T. and G. Fl. II, 483 (1841).

Wats. and Coult., Gray's Man. 6 ed. 301; Upham, Fl. Minn. 90; Webb., Fl. Neb. 143; Gray, Syn. Fl. I, 2, 433; Cov., Fl. Ark. 199.

North America: Ohio to Minn., Iowa, Neb., Mo. and La.

Minn. valley: W. and N. W. districts; dry or sterile fields and prairies.

HERB.: *Taylor* 1064, Glenwood; *Sheldon* 1349, Verdi, Lincoln Co.; *Sheldon* 1325, Lake Benton; *Sheldon* 1437, Dakota line, near Elkton; *Sandberg* 356, Cannon Falls.

Prenanthes racemosa MICHX. Fl. N. Am. II, 84 (1803),

Nabalus racemosus DC. Prodr. VII, 242 (1837-1839).

Wats. and Coult., Gray's Man. 6 ed. 301; Britt., Fl. N. J. 155; Upham, Fl. Minn. 90; Mac., Fl. Can. 282, 559; Coult., Fl. Colo. 220; Gray, Syn. Fl. I, 2, 433.

North America: Anticosti, Newf., Q., Ont., Gt. lake reg. to Saskatchewan and 49° N. lat.; S. to N. Eng., N. J. and Penn.; W. to Minn., Colo. and Mo.

Minn. valley: Throughout, especially west; prairies and borders of sloughs.

HERB.: *Taylor* 1065, Alexandria; *Sheldon* 1354½, Verdi, Lincoln Co.; *Taylor* 1148, Glenwood; *Sheldon* 1593, Lake Benton; *Sheldon* 1305, Lake Benton; *Sandberg* 355, Red Wing; *Herb. Wickersheim* 87, Ash lake, Lincoln Co.

Prenanthes crepidinea MICHX. Fl. N. Am. II, 84 (1803).

Nabalus crepidineus DC. Prodr. VII, 241 (1837-1839).

Wats. and Coult., Gray's Man. 6 ed. 301; Upham, Fl. Minn. 90; Chap., Fl. S. St. 251; Gray, Syn. Fl. I, 2, 433.

North America: N. Y. to Penn. and Minn.; S. to S. Car. and Tenn.

Minn. valley: Reported from W. edge; rich, damp soil along streams or in prairie sloughs.

CREPIS LINN. Gen. 621 (1737).

Catonia and **Barkhausia** MOENCH, Meth. 535, 537 (1794).

Hostia MOENCH, Meth. Suppl. 221 (1802).

Lepicaune LAP. Pl. Pyren. 478 (1813).

Omalocline, **Aethiorhiza**, **Paleya**, **Anisoderis**, **Nemauchenes**, **Gatyona**, **Brachyderea**, **Intybellia**, **Phaecasium** CASS. Dict. XVIII, XXXIV, XXXIX, XXIII, XLVIII (1826).

Youngia CASS. Op. Phyt. III, 86 (1834).

Pterotheca CASS. Bull. Philom. (1816).

Sclerophyllum GAUD. Fl. Helv. V, 47 (1829).

Idianthes DESVX. Fl. Anjou, 199 (1827).

Calliopea and **Haplostephium** DON, N. Edin. Phil. Jour. 307, 309 (1828).

Soyeria, **Aracium**, **Intybella** MONN. Ess. Hier. 75 (1829).

Derouetia, **Psammoseris**, **Cymboseris** BOISS. Diagn. Or. 2, V, 114, XI, 52, 50 (1843).

Heteroseris BOISS. Fl. Or. III, 793 (1870).

Intybus FRIES, N. Fl. Suec. ed. 2, 244 (1828).

Geracium REICH. Moessl. Fl. Deutsch. (1834).

Anthochytrum REICH. Ic. Germ. XIX, 39 (—).

Crepinea REICH. Fl. Germ. Exc. 269 (1830).

Anisoramphus, **Endoptera**, **Phalacroderis** DC. Prodr. VII, 97, 178, 251 (1838).

Barkhausenia HOPPE, Flora 512 (1829).

Lagoseris, **Borkhausia** LINK, Enum. Berol. II, 289, 290 (1822).

Billotia SCH. BIP. Flora 707 (1859).

Vigineixia POM. N. Mat. Fl. Atl. 12 (1874).

Ceramiocephalum SCH. BIP. Bull. Soc. Bot. Fr. IX, 284 (—).

Crepidium TAUSCH. Flora 80 (1828).

Crepidium NUTT. Trans. Am. Phil. Soc. 2, VII, 435 (1841).

Psilocaenia NUTT. Trans. Am. Phil. Soc. 2, VII, 437 (1841).

Berinea BRIGN. Pl. Forojul. 50 (1810).

Trichocrepis VIS. St. Dalm. 19 (1826).

Rodigia SPRENG. Neu. Entd. I, 275 (1820) *part.*

Benth. and Hook., *Gen. Pl.* II, 513, 515, 516; Baillon, *Hist. Pl.* VIII, 108 (*sub Picris* Linn.); Durand, *Ind. Gen. Phan.* 233.

Living species: 160±; N. hemisphere; N. America, 9-10; center in Europe and Asia. In N. America, principally N. and W.

Crepis runcinata (JAMES) T. and G. Fl. II, (1841).

Hieracium runcinatum JAMES, Long Exp. I, 453 (1825).

Crepidium runcinatum NUTT. Trans. Am. Phil. Soc. VII, 436 (1841).

Crepis biennis var. *B.* HOOK. Fl. I, 297 (1833) *not Linn.*

C. biennis var. *americana* DC. Prodr. VII, 163 (1837).

Gray, Syn. Fl. I, 2, 431; Coult., Fl. Colo. 219; Mac., Fl. Can. I, 274; Brew. and Wats., Fl. Calif. I, 436; Upham, Suppl. Minn. 47.

North America: Saskatchewan to Minn., Mont., Colo. and California.

Minn. valley: W. to S. W. districts; infrequent; prairies and moist fields.

HERB.: *Huntington* 14, Rock Co.; *Wickersheim* 131, Idlewild, Lincoln Co.; *Moyer* 244, Montevideo.

HIERACIUM LINN. Gen. 620 (1737).

Pilosella SCH. BIP. Flora 417 (1862).

Schlagintweitia GRISEB. Comm. Hierac. 76 (—).

Chlorocrepis GRISEB. l. c. 75 (—).

Stenotheca MONN. Ess. Hierac. 71 (1829).

Mandonia SCH. BIP. Linn. XXXIII, 757 (1859).

Crepidosperrum FRIES, Epic. Hierac. 153 (1848).

Heteropleura SCH. BIP. Flora. 434 (1862).

? **Apatanthus** VIV. Fl. Lib. Spec. 54 (—).

Andryala LINN. Gen. 915 (1737).

Forneum ADANS. Fam. II, 112 (1763).

Voightia ROTH, Roem. and Ust. Mag. IV, 17 (—).

Rothia SCHREB. Gen. 531 (1791).

Baillon, *Hist. Pl.* VIII, 109; Benth. and Hook., *Gen. Pl.* II, 516; Durand, *Ind. Gen. Phan.* 233.

Living species: 500 described; 200 reduced (B. and H.); Europe, 185; Russia, 50?; Russian Europe, 46; N. America, 25; Canada, 15; Rocky mts., 8; E. Sts., 7; S. Sts., 4; Calif., 5-6; Pl. King, 3; Pl. Wheel., 1; W. Tex., 2.

Hieracium longipilum TORR. Hook. Fl. Bor.-Am. I, 298 (1833).

H. barbatum NUTT. Journ. Phil. Acad. VII, 70 (1834).

Wats. and Coult., Gray's Man. 6 ed. 299; Webb., Fl. Neb. 143; Upham, Fl. Minn. 90; Mac., Fl. Can. I, 276; Cov., Fl. Ark. 198; Coult., Fl. Colo. 217; Gray, Syn. Fl. I, 2, 426 and Suppl. 455; Coult., Fl. Tex. 248.

North America: Ont. and Mich. to Minn., Neb. and Tex.

Minn valley: Forest district to Blue Earth Co.; rare; openings and damp meadow-land.

HERB.: *Sandberg* 353, Red Wing.

Hieracium venosum LINN. Spec. 800 (1753).

H. gronovii LINN. Spec. 802 (1753).

H. subnudum FROEL. DC. Prodr. VII, 218 (1837) *chiefly*.

Stenotheca venosa MONN. Ess. Hier. 72 (1829).

Wats. and Coult., Gray's Man. 6 ed. 299; Gray, Syn. Fl. I, 2, 425; Webb., Fl. Neb. 144; Britt., Fl. N. J. 153; Chap., Fl. S. St. 250; Mac., Fl. Can. I, 276; Upham, Fl. Minn. 90.

North America: Ont. and N. J. to Saskatchewan, Minn. and Mont.; S. to Ga., Tenn., Neb. and Ark.

Minn. valley: Forest district; and N. W. district; infrequent; woods and plains.

HERB.: *Ballard* 577, Rice lake, Scott Co.; *Ballard* 167, Shakopee; *Ballard* 259, Jordan, Scott Co.; *Sandberg* 607, Red Wing; *Holzinger* 296, Winona Co.

Hieracium canadense MICHX. Fl. N. Am. II, 86 (1803).

H. virgatum, fasciculatum, macrophyllum PURSH. Fl. Am. 504 (1814).

H. scabriusculum SCHWEIN. Long's Exp. (1825).

H. kalmii SPRENG. Syst. III, 646 (1826).

H. prenanthoides HOOK. Fl. Bor.-Am. I, 300 (1833).

H. helianthifolium FROEL. DC. Prodr. VII, 198 (1838-1839).

H. corymbosum FRIES, Symb. Hier. 185 (1848).

H. auratum FRIES, Symb. Hier. 181 (1848).

Wats. and Coult., Gray's Man. 6 ed. 299; Britt., Fl. N. J. 153; Upham, Fl. Minn. 90; Mac., Fl. Can. I, 275; Coult., Fl. Colo. 217; Gray, Syn. Fl. I, 2, 425.

N. Europe.

North America: Greenland to S. Man.; N. S. to N. J.; N. Y., Penn.; W. to Mackenzie, Oregon and Brit. Col.; S. to Minn. and Colo.

Minn. valley: N. districts, and perhaps throughout forest district; dry woodland or thickets.

HERB.: *Holzinger* 134, Hancock; *Bailey* 522, Agate bay; *Kassube* 146, Minneapolis.

SUMMARY.

| | | | |
|--|---|---|-------------|
| TOTAL NUMBER OF FAMILIES, | - | - | 106 |
| TOTAL NUMBER OF GENERA, | - | - | 407 |
| TOTAL NUMBER OF SPECIES AND VARIETIES, | | | 1174 |

THE VALLEY OF THE MINNESOTA RIVER.

Location of the valley. The basin occupied by the Minnesota river and its various tributary streams is a tract of country approximately 16,600 square miles in extent, and lying between the 93d and 97th meridians west of Greenwich, and between $43^{\circ} 20'$ and $46^{\circ} 20'$ of north latitude. It comprises portions of the states of Minnesota, Iowa and South Dakota, but of its total area 15,706 square miles is within the borders of Minnesota. It includes in Iowa portions of Winnebago and Kossuth counties, and in South Dakota portions of Roberts, Grant, Deuel and Codington counties. In Minnesota it includes the whole of the counties of Swift, Lac Qui Parle, Chippewa, Yellow Medicine, Redwood, Brown, Watonwan, Nicollet and Blue Earth, together with larger or smaller areas in Big Stone, Stevens, Grant, Pope, Douglas, Otter-Tail, Kandiyohi, Renville, Sibley, Carver, Hennepin, Dakota, Rice, Le Sueur, Waseca, Steele, Freeborn, Faribault, Martin, Jackson, Cottonwood, Murray, Pipestone, Lyon and Lincoln counties. The general outline of the basin is that of a somewhat elongated and bent ellipse, the convexity facing southward, and its greatest diameter is in a direction northwest by southeast.

At Brown's Valley, between lake Traverse and Big Stone lake, is the divide between Hudson Bay and Gulf of Mexico drainage. Lake Traverse is one of the head lakes of the Red river of the North, the waters of which, by way of lake Winnipeg and the Nelson river, empty into Hudson Bay. In Itasca county, one hundred and fifteen miles northeast from the north west extension of the Minnesota valley, lies Bow-String lake, of which the waters drain into the Rainy river. Between Bow-String lake and the head waters of the Pomme de Terre and Chippewa rivers, tributaries of the Minnesota, lie the head waters of the Mississippi. On the southwest of the Minnesota valley, just over the divide in Lincoln county, the streams are tributary to the Missouri river. As an

area of drainage, then, the valley of the Minnesota is one of central location. Its continental position is no less central. If the 50th meridian west of Greenwich be taken for the eastern boundary of the solid portion of the North American continent and the 140th meridian, passing near Mount St. Elias and cutting off the great Alaskan peninsula, for the western, the intermediate meridian will be the 95th west of Greenwich, and this meridian passes squarely through the valley of the Minnesota, cutting the counties of Jackson, Cottonwood, Brown, Redwood, Renville and Kandiyohi. Or if the meridian of 20° west be taken for the eastern boundary of the North American continent, thus including the whole of Greenland, and the meridian of 170° west be taken for the western boundary, thus including the Alaskan peninsula and passing through Berings straits, the intermediate meridian as before is the 95th west. In like manner, if the parallel of 70° north latitude, passing near the mouth of the Mackenzie river, and the parallel of 20° north latitude passing near the city of Mexico be adopted as the northern and southern boundaries, respectively, of the solid portion of the North American continent, the intermediate parallel will be the 45th of north latitude and this passes through Hennepin, Kandiyohi, Chippewa and Lac Qui Parle counties of the valley in Minnesota, and through Grant and Codington counties in South Dakota. The same 45th parallel becomes the intermediate one if 80° north latitude be selected for the northern boundary and 10° north latitude for the southern. The 95th meridian and the 45th parallel intersect in Kandiyohi county just at the north edge of the valley.

The continental and hydrographic position of the Minnesota basin is seen to be peculiarly central and this adds much to the interest of determining the character of its plant inhabitants.

General topographical features. Big Stone lake which is the head lake of the main stream lies at an altitude of 962 feet above the sea. Into the northwestern part of this lake, near the town of Brown's Valley, the head stream enters after running for about twenty-two miles in a southeastern direction from the Coteau des Prairies of South Dakota. This head stream drains land that lies at an elevation of 2,000 feet above the sea level. The two principal tributaries from the north are the Pomme de Terre and the Chippewa rivers, both of which arise in the high morainic hills of southern Otter Tail county. Some of these hills reach an altitude of 1,750 feet above the level of the sea. Lake Stalker which is the head

lake of the Pomme de Terre stands at a level of about 1,340 feet. The Leaf hills are in part drained towards the southwest by the Chippewa river and in part towards the northwest by the Red river of the North. Some of these hills reach the altitude given above, of 1,750 feet. On the other side of the Minnesota basin, more than one hundred and twenty-five miles to the southwest, lies the Coteau des Prairies, forming the southwestern boundary of the valley and reaching at different points an elevation of from 1,900 to 1,950 feet above the level of the sea. Lake Benton which is the head lake of the Redwood river lies at an elevation of 1,754 feet above the sea level. From these extremes of elevation northwestward, westward and southwestward, the basin inclines gently toward the east. At low water the mouth of the Minnesota river, where it discharges its waters into the Mississippi at Fort Snelling, lies at an altitude of 688 feet above sea level and the flood-plane at this point is 710 feet. In Hennepin county some of the lands drained by Nine Mile creek, which empties from the north into the Minnesota, near its mouth, lie at an altitude of about 1,000 feet, while just across the basin, in Dakota county, the southern edge attains in places an altitude of about 1,100 feet.

Character of the basin. The main stream of the basin—the Minnesota river—from the head of Big Stone lake to Fort Snelling, runs in a gorge varying in width from half a mile to four miles, and about 230 miles in length. The sides of this gorge rise, with slopes of from twenty to forty degrees, to from one hundred to two hundred and thirty feet above the level of the river, and to the general country level. The river itself is nowhere a large stream and except at a few points does not wash the bases of its bluffs, but flows in a trench through alluvial deposits. From the edges of this trench level country, diversified with many ponds, extends to the bases of the bluffs, broken in many places by exposures of gneissic and gabbroid rocks. Not far from the town of Morton, a notable diabasic dyke, 175 feet wide, cuts across the gorge. Besides this very large dyke there are upwards of twenty others in the region of the crystalline rocks. In general there are few exposures of rock below the town of Beaver Falls, but above this point the whole floor of the gorge is often broken for miles with the outcrops.

The average width of the Minnesota valley is not far from 100 miles. On the north it extends among the morainic hills of the belt which stretches from Lake Minnetonka to Otter

Tail county and sparingly into Dakota. On the south it is bounded by the high land of the Coteau des Prairies. The greater portion of the basin consists of rolling prairies intersected by numerous sluggish streams, but along the northern edge and in a considerable part of the far northwestern and the eastern and southeastern areas the basin includes the characteristic hills of a terminal or median moraine, and for the most part these hills are clothed with growths of hardwood timber. The Minnesota valley lies outside of the great lake belt of the state, which runs just north of its border, but a large number of lakes are found within its limits. These lakes are most abundant in the far northwestern, eastern and southeastern portions of the basin and are least abundant in the western, central western and southwestern portions.

Distribution of forest and prairie. The streams of the basin are generally wooded along their courses and the great gorge of the river is heavily timbered as far up as Montevideo. The northern bluffs are much more sparsely clothed with forest than the southern and for long distances between Mankato and Montevideo are either altogether bare of timber or but scantily covered in comparison with the bluffs across the river. The headwater regions of the Pomme de Terre and Chippewa rivers are wooded and the northern edge of the basin shows frequent incursions of the northern forest belt. The only coniferous tree which reaches the valley is the larch or tamarack—*Larix americana*—and only a few of the characteristic tamarack swamps occur in the valley. The northeastern and eastern portions of the valley are within the limits of the hardwood forest. Such portions of the basin as lie in the counties of Hennepin, Carver, Scott, Rice, Le Sueur and Sibley are for the most part timbered and a part of the area in Blue Earth, Waseca and Nicollet counties belongs to the same forest belt. This belt extends somewhat more than ten miles southwest of Mankato and up the Le Sueur river beyond Waseca. It gradually fades out into the prairie regions south and west.

Such being the general distribution of forest and prairie it is apparent that the various intermediate conditions will prevail along the demarcation lines between the two main plant physiognomic formations. Meadows, marshes, swamps and bogs are not infrequent, being especially abundant in the bottomland of the main stream in that portion lying between Mankato and Fort Snelling. In the prairies of the valley

sloughs, marshes and occasional swamps break the general monotony. In spite of the preponderance of the rolling prairie the diversity of conditions in the valley as a whole permits it to maintain a fairly diversified flora.

Soils. In view of the lack of any systematic analyses of soils in the Minnesota valley it is possible to speak only in general terms of the various conditions that may be discovered. Practically the whole of the valley is covered with glacial drift and this consists of a mixture of sand, gravel, clays and boulders. Cretaceous clay is the most abundant component of the soil. This matrix is covered over with a mantle of black soil, resulting from the decay of unnumbered generations of plants, and from six inches to three feet in thickness. Throughout the bottomland of the main gorge the general thickness and fertility of the soil is most noteworthy. In the region of metamorphic rocks above Fort Ridgely this thickness diminishes in places, but to the head of the gorge areas of maximum thickness may be discovered. On the rolling prairies the soil is scarcely different in general character, so far as concerns the growth of plants. The matrix is for the most part of unmodified drift, while in the main gorge and at other points, the substratum often consists of modified or stratified drift. Boulders are very rare in the basin of the Minnesota, their area of frequency being confined to the northern and morainic portions. The clays are of the ordinary sort found in Minnesota glacial till. Blue and red clays are predominant. In some portions of the valley saline and alkaline soils are found, but such areas are small and are confined for the most part to the western and southwestern areas. No characteristic saline or alkaline marsh occurs in the valley, although several in which the water is somewhat brackish have been noted. The saline or alkaline areas are commonly marked enough to favor the development of characteristic plants, such as various *Chenopodiaceæ* and *Polygonaceæ*.

The soils are classified by N. H. Winchell into seven groups as follows: (1) Red till soil; (2) gray till soil, timbered; (3) gray till soil, prairie; (4) loam with gravelly subsoil; (5) laminated clay soil and subsoil; (6) sandy soil with sand or fine gravel as subsoil; (7) alluvium. This is a geological classification, but may serve in the absence of any based on other characters. From a chemical point of view the data are not at hand to make the classification which would be the most useful to the botanist. Of the groups of soils named above the gray

till soil is the most prominent in the Minnesota valley and occurs in both prairie and forest region. It is somewhat more fertile than the red till and second as a subsoil only to the alluvium. The fertility of any soil is, however, secondary so far as concerns the subsoil and it is to the layer of loam which covers the till that the productive qualities must largely be referred. The loam varies in its per cents. of nitrogenous substance, but in general maintains a high average.

Climate. Owing to the short time during which meteorological observations have been made in the valley of the Minnesota it is not possible to get all the data that are desirable for an explanation of its climate. From the statistics compiled for the Smithsonian Institution, by Schott, I am able to present the following table of mean annual and seasonal precipitation at certain points of interest.

TABLE OF PRECIPITATION.

In this table the figures are means arranged from observations extending over various periods. The precipitation is given in inches and fractions.

| | LAT. | LONG. | ELEV. | SP'NG | SUM. | AUT. | WINT | YEAR. | EXTENT OF OBSER'N |
|--------------------|---------|---------|-------|-------|-------|------|------|-------|-------------------------|
| Ft. Ridgely..... | 44°.30' | 94°.45' | 1230 | 6.48 | 9.11 | 5.86 | 4.02 | 25.47 | 13 years |
| Ft. Snelling | 44°.53' | 93°.10' | 820 | 6.20 | 10.14 | 6.40 | 2.57 | 25.31 | 38 years |
| Lac Qui Parle..... | 45°.00' | 95°.30' | 946 | 7.78 | 11.84 | 6.47 | 2.98 | 29.07 | 5 years |
| New Ulm..... | 44°.00' | 94°.30' | 1007 | 6.55 | 11.38 | 5.49 | 2.53 | 25.95 | 10 years |
| Madelia..... | 44°.19' | 94°.30' | 821 | 7.41 | 9.87 | 7.39 | 4.21 | 28.88 | 2 years |
| St. Paul..... | 44°.58' | 93°.03' | 693 | 7.81 | 12.14 | 7.09 | 3.01 | 30.05 | 17 years |

At Ft. Snelling the maximum annual precipitation during the period was in 1849 when 49.69 inches of water was precipitated. The minimum was in 1852 when 15.07 inches was precipitated. The observations extend from 1837 to 1874.

At St. Paul the maximum was in 1865 when 38.14 inches fell. The minimum was in 1864 when 14.86 inches fell.

The mean yearly precipitation, as indicated upon the isohyetal maps prepared by Schott, varies in the Minnesota valley from 20 to 32 inches. It is greatest in the region around Ft. Snelling and least in the high land of the western boundary.

For the spring, summer and autumn the mean precipitation in the delta region of the Mississippi is respectively 18 inches, and for the same region the winter precipitation is 16 inches, making a total mean precipitation of 70 inches.

Through the kindness of Director Harmon of the Minnesota Weather Service, I have been able to compile from records preserved on file in his office at Minneapolis the following tables of precipitation and temperature of three important points in the valley of the Minnesota. St. Paul is near the mouth of the main stream. Mankato is in the southern central region. Morris is in the northwestern region. Thus the points are fairly illustrative. The figures represent averages of monthly means and summations of averages for the average yearly mean. The period covered by the observations is six years.

TABLE OF PRECIPITATION.

| 1886-1891. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Year |
|-------------|------|------|------|------|------|------|------|------|-------|------|------|------|-------|
| Morris | .35 | .38 | .81 | 1.55 | 1.81 | 4.00 | 4.12 | 2.43 | 2.58 | 1.09 | .38 | 1.03 | 20 53 |
| St. Paul... | 1.13 | .64 | .93 | 2.76 | 2.50 | 3.25 | 2.98 | 3.22 | 2.29 | 1.29 | .90 | 1.31 | 23.20 |
| Mankato.. | 1.46 | 1.05 | 1.16 | 2.80 | 2.94 | 2.74 | 2.91 | 1.87 | 2.23 | 1.06 | 1.00 | 1.82 | 23.04 |

Morris: lat. $45^{\circ} 30'$; long. $95^{\circ} 58'$; alt. 1,129 feet.

St. Paul: lat. $44^{\circ} 58'$; long. $93^{\circ} 03'$; alt. 693 feet.

Mankato: lat. $44^{\circ} 06'$; long. $94^{\circ} 01'$; alt. 791 feet.

TABLE OF TEMPERATURE.

| 1886-1891. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Year |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Morris | 6.91 | 7.03 | 22.76 | 44.76 | 55.23 | 66.58 | 69.93 | 66.36 | 58.16 | 44.18 | 27.0 | 16.75 | 40.47 |
| St. Paul... | 10.85 | 12.68 | 25.48 | 46.22 | 56.45 | 66.96 | 71.28 | 67.38 | 58.98 | 46.25 | 29.91 | 21.55 | 42.83 |
| Mankato.. | 11 52 | 14.75 | 27.61 | 48.28 | 56.90 | 68.47 | 72.12 | 67.40 | 59.88 | 47.15 | 31.66 | 23.71 | 44.12 |

From these tables it is seen that the range of temperature is somewhat higher in the eastern than in the western portion of the valley and somewhat higher, too, in the southern than in the northern. The precipitation is greater in the north-eastern corner than elsewhere. This is, however, the principal position of the forest area of the valley. It is probable that forest and rainfall have a reciprocal influence upon each other.

So far as the data of prevailing winds have been examined it is impossible to make any valuable generalisations from them except that the shape of the valley produces some diversions in different portions. What these diversions are or what law governs them, I am unable to say.

Average cloudiness is unfortunately not a matter of record to such an extent that anything can be done with it.

The climate is a characteristic inland North American one. The rainfall has its source almost entirely in the Gulf of Mexico vapors which extend up the Mississippi valley, precipitating themselves in less and less amount as they pass from the mouth of the Minnesota river to its headwaters. A summer maximum of precipitation is conspicuous. The temperature is, of course, less than that of points on the same parallels in the old world, such as Marseilles, Florence or Odessa. It presents conspicuous summer maxima and winter minima.—40° Fahr. is reached occasionally during the months of January or February, and—30° Fahr. frequently. In the summer, 95° Fahr. is reached occasionally and 90° Fahr. during almost every summer. The variations are more excessive in the western and prairie regions than in the eastern and forest regions, where the range of maxima and minima is least. The sheltering effects of the forest, the lower altitude, and possibly the smaller width of the valley, by interfering with cold or hot winds, have much to do with this difference. The snow-fall is greatest in the northwestern portion. The first frosts usually occur near the middle of September, and the ice breaks up in the streams late in March or early in April.

Phaenological observations. No reliable phaenological observations have been made in the valley of the Minnesota. In general, as elsewhere in the northern hemisphere, the plants of the northern range are first to flower, and those of most southern range last. The time of flowering of any species is a useful indication of its history, and observations along this line are much needed. The first shrub to put forth leaves is usually *Artemisia dracunculoides*, the first trees to flower, the various species of *Salix*. In the autumn a characteristic composite-flowering is seen in the golden-rods, asters and sunflowers of both prairie and forest region. The mid-summer season finds the prairies gay with the purple of *Laciniaria* and *Astragalus* or *Spiesia*. The oaks are usually among the last trees to drop their leaves, and the cottonwoods among the first. Among herbaceous plants chlorophyll persists the longest in the grasses.

Geological history of the Minnesota valley. The Minnesota river of today occupies an ancient gorge which was evidently formed previous to the Cretaceous period, for Cretaceous clays are found in eroded hollows of the Shakopee limestone in Le Sueur, Nicollet and Blue Earth counties and Cretaceous sandstones, clays and shales in the Cottonwood and

Redwood valley districts, and near Fort Ridgely. This indicates that some ancient stream had cut a gorge in the Lower Magnesian rocks and had drained northern Minnesota into the great Cretaceous Mediterranean. Since no Tertiary deposits are found in Minnesota it may be concluded that they, with most of the Cretaceous strata, were torn up by the ice-sheet of the first glacial epoch. In this way the ancient gorge was filled with debris and while this does not consist altogether of unmodified drift, it is in some part of such nature. The presence of beds of sand and gravel deep in the till indicates that streams must have carried on their work during the subsidiary interglacial epochs and doubtless vegetation re-established itself during some or all of these interglacial periods, for vegetable debris is found in the lower forest beds of the till. By this ploughing up before the first great ice-sheet of the Quaternary age, the Cretaceous deposits and the Tertiary, if any existed, were mingled together into a layer of till from 265 feet thick, in places, down to somewhat less than a hundred, on higher levels. This layer of till persists over most of the Minnesota valley to the present time. During the epoch of the deposition of this first layer of till the ice-sheet extended south to Cincinnati and northern Kentucky, and into Missouri. Almost the whole of Minnesota was covered by it. As recession began, exposing the surface of the country once more, the melting ice and snow sought out the gorge of the Minnesota and it served as a drainage-trough for vast quantities of water. In this epoch it was the outlet channel of a large glacial lake which occupied the valley of the Red river and must have been somewhat similar in extent and character to the later glacial lake Agassiz. During this period excavation of the till which had filled the gorge was carried on and doubtless a large river occupied the present bed of the Minnesota.

Later a second principal encroachment of the ice began and extended south to Des Moines, Iowa. During its recession it piled up the Leaf hills moraine which bounds the Minnesota valley on the north. As the ice retreated from the morainic area the valleys of the Red and Saskatchewan were occupied by the glacial lake Agassiz and from the southern boundary of the lake its waters were drained through lake Traverse, Brown's Valley and Big Stone lake along the present gorge of the Minnesota river. Under the erosive energy of this large stream, which filled the gorge from bluff to bluff,

much of the glacial till of both epochs was washed away thus exposing the older crystalline rocks of the upper region as they are now seen protruding from the floor of the valley. In this region of the crystalline rocks it is easy to imagine how turbulent must have been the river Warren, as Upham has named it, in its flow. When the ice finally retreated beyond Hudson Bay the drainage of the lake Agassiz region set towards the north, as it remains to the present. A divide appeared in the old gorge of the river Warren and the extreme upper portion now occupied by lake Traverse served as a head lake for the northern trending waters, while the great extent, from the head of Big Stone lake to the mouth of the present river, was used by a much diminished stream, the Minnesota river of modern times.

During both the first and second post-glacial periods, when the Minnesota gorge was draining to the sea large bodies of fresh water which had resulted from the melting ice, it was eroded to a much greater depth than to-day. The gorge of modern times is about one-half filled with the more or less modified till of the two epochs and the alluvial deposits of the interglacial and final post-glacial periods. At Belle Plaine, for example, as reported by A. Winchell, in a well dug on the bottom-lands of the gorge the rock was found 170 feet below the present surface of the river. This indicates, then, an erosive action having made itself felt at almost four hundred feet below the present general country surface. The river Warren, after its waters had ceased to carry and deposit modified drift became, as Upham has shown, "a powerful eroding agent," and doubtless at this period the gorge was cut to its greatest depth. Since the diminution of the stream owing to the disappearance of lake Agassiz, the tributaries have brought in considerable silt and by the deposition of this silt by the different streams the gorge has come again to be partly filled with alluvium. The Lac Qui Parle river has thrown a dam of sediment across the channel of the present Minnesota and this has formed the back-water lake known as Lac Qui Parle. The sluggishness of the Minnesota at its mouth, and for thirty miles up stream, is in a like manner due to the sediment thrown across its mouth by the Mississippi.

In Blue Earth county a smaller glacial lake existed which drained into the Des Moines river by Union slough, and perhaps also, at other times, into the river Warren by way of the Blue Earth river gorge. Whether the river Warren at any time

flowed through the old Blue Earth lake is doubtful. Rather is it probable that the lake was formed earlier than lake Agassiz and was bounded like lake Agassiz by the northern ice sheet.

Since the final recession of the ice from the valley of the Minnesota fluvial action has been going on, building up meadow land. Many of the lakes left by the glacial period have either filled or have become much restricted in size. The successive generations of plants which have lived and decayed upon the surface of the country have contributed to the soil and this in varying extent has been redistributed by the action of water and, very slightly, by the winds. The prairie has been steadily encroaching on the forest and probably the forest of today is much more limited in its extent over the valley than formerly. Under the general forces at work, then, the valley as it is seen to-day is the product of a long evolution and it has reached its present characters of topography, as of climate, geography, plant and animal population, by the constant interworking of definite and, to some extent, calculable forces. The impressive history of the river valley is, however, to be matched with the equally impressive story of the varying fortunes and the long struggle of its plant-inhabitants with each other, and of the general conditions under which and through which they have come to present the characters, distribution, prevalency and habits that are to be discovered in them by the study of the modern flora.

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RELATIONSHIPS OF THE METASPERMIC FLORA OF THE MINNESOTA VALLEY.

Statement of the problems. As has been explained above, the evidence is conclusive that within times geologically recent the valley of the Minnesota was encroached upon by a continental glacier which doubtless destroyed all the metaspermic plants that had previously established themselves within the borders of the basin. To-day, as indicated in the list preceding, 1,174 species and varieties of metaspermic plants are known to exist where previously there were none. This impressive fact at once suggests a multitude of questions: How did the present plant inhabitants enter the Minnesota valley? In what order did they enter? Which are the old settlers and which the comparatively recent immigrants? What relation does this modern plant-population bear to the more ancient one which was overwhelmed by the glacial detritus piled 250 feet thick over the old level of the country? How is it that some kinds of plants are established more abundantly than others? What has determined the various habitats of the different species? Why are the individuals more numerous in some species than in others? How long did the immigration take? Along what routes did the incoming plants travel? What relation does the present metaspermic flora bear to those of adjacent or more distant regions? Under what laws did the repopulation of the valley progress? Does this immigration still continue? What is the trend of evidence derived from the present and from the past concerning the future movements of plant-population in the valley of the Minnesota? These are but illustrative of the problems that press for solution when the plants of any natural region are given systematic study. To answer some of them is the purpose of these pages.

The dynamic inter-relations of plants. It is necessary first of all to call attention to a fact well known but not universally apprehended. The plant-population of the globe is nowhere in a static condition but is always undergoing flux and modification. This shifting about of plants is recognised at once in those cases where the agency of man has intervened. The

presence of the harmful foreign weed is heralded, and measures are taken to prevent its securing a foothold, for it is understood that if it be a plant of robust habit it will conquer for itself an abiding place at the expense of other weaker plants with which it may come in contact during its struggle for existence. Every individual plant must make its way in the world. It must either win new territory, maintain what it has already won, or cede its place of abode and growth to some plant better fitted to cope with the conditions peculiar to that particular spot. It thus happens that the flora of any region—that is to say the plant-society of the region—is in the same condition of mutual interdependence and mutual competition that we discover in human society. Complex inter-relations of individual with individual, species with species, formation with formation arise and the plant-population of any area so far from being stable in its composition is in a continual state of battle for soil, light, moisture, heat and useful alliances, both in the physical and biological sense of the word. Thus, in a forest, the pine-trees compete with each other for light, each taller one than the rest gaining a distinct advantage; hard-wood timber antagonises the coniferous and along the forest skirmish-line will be found slowly working its way up the streams, gradually isolating the coniferous trees into separate groves, ready at the first sign of misfortune or weakness in the opposing species to seize and occupy its territory. Again forest and prairie—the two most notable plant formations of the Minnesota valley—each tenanted by hundreds of species characteristic if not peculiar—carry on a silent warfare with each other and as the chance of battle swings in the favor of the one, the other is imperceptibly but surely driven back.

It happens then, to return to the illustration, that we find plants organised much as is human society. The individuals of each species compete with each other for favorable habitats and for the optimum of growth-materials and energising forces. Each species competes with those around it and in this competition the individuals might be said to stand shoulder to shoulder against the common foe, as may be seen in the united efforts of a human tribe or nation against some warring body. And again groups of species, having perhaps a common line of movement or a common need to be supplied, band themselves together and find arrayed against them other united groups of species competing for the same necessity or striving to move in the opposite direction.

By the assistance of this fact of organised and stratified competition in the realm of plant society the dynamic relations of plants to one another are, in general, to be explained. We no longer permit ourselves to look at a grove standing in the midst of the prairie as stable or even as quiescent, but we picture to ourselves the complex condition of strain which exists in varying degree and under different degrees of organisation, between the different plants, species and groups of species. Such a dynamic condition should perhaps be recognised in terminology more than it is and instead of speaking of the northern group of plants one should name such a floral element the *south-bound* group and instead of calling by the name of "southern" those plants which occupy a southern range one should refer to them as *north-bound*. For certainly the exigency of existence is such for every creature that it welcomes an expansion of opportunity for development. Room for growth is an important factor of such an opportunity, and for the plant already established in high northern latitudes this room for growth is to be found only by a southward extension.

General features of plant-distribution. The total number of flowering-plant species at present occupying the crust of the earth is estimated by De Candolle to be in the vicinity of 250,000. The mean area of each species is about $\frac{1}{150}$ of the surface of the globe or 45,500 square leagues. Of this number the valley of the Minnesota with its 16,600 square miles of country contains 1,174 species or about $\frac{1}{222}$ of the whole number. The relationships of this flora can be understood only after a general survey of the distribution of plants over the whole earth.

If one should follow any parallel of latitude that might be selected until he returns to his starting point he would pass through regions characterised by diversities of plant-population. As he crossed rivers, mountain ranges and oceans, the familiar plants of one region would become fewer in the adjacent region and very likely disappear. When half way around the earth from the point of departure our hypothetical traveler would find himself in a floral region distinctly different from the one of his starting point. This difference would in general increase in amount and distinctness inversely with the height of the latitude. At the equator or near it the difference would be great, while on the parallel of 70° N. lat. or 70° S lat. the differences both in amount and distinctness would be less. The increase in differences as the latitude decreased

would, however, be proportional to the increase in the length of the parallels, so that, in point of position by longitude, the differences in plant groups, species and formations vary directly with the distances they are from each other. In this case, thus generally stated, the differences in elevation, trend of isotherms, direction of prevailing winds, etc., which might be found on the same parallel of latitude, are disregarded in order to simplify the statement. Such differences would have only a modifying, not a fundamental effect on the facts of distribution.

But if the traveler selected some meridian for the line of his journey around the earth, the changes in the plant-inhabitants as he passed from region to region would be greater in amount and very much more conspicuous than in the former case where a parallel of latitude was selected. In circling the northern hemisphere one may, at a moderate degree of latitude, pursue almost the entire journey in a coniferous forest over the land areas, and in a region of distinctive fucoid and red algae over the water areas of the journey. No such uniformity of floral aspect would be maintained if a meridian be selected. From the sphagnum and tundra region of the pole, one would pass into coniferous forest, hardwood forest, evergreen tropical forest, and into the deserts, savannahs and virgin forest of the equatorial region. Then in inverse order the same changing panorama with, however, an almost entirely new series of forms would unfold itself as the traveler neared the opposite pole. In the course of his journey he would find that the greatest differences of all are those that exist between the plant-inhabitants of the north temperate and south temperate regions. The difference between the United States and the Argentine Republic is far more conspicuous than the difference between the United States and Siberia or Europe. And in like manner the difference between Asia and Australia is greater than that between Australia and the Cape of Good Hope or Chile.

In general, in either the northern or the southern hemisphere, in point of position by latitude, the differences in plant groups, species or formations varies directly with the differences in humidity. As the equator is approached the average annual precipitation progressively increases over most of the surface of the earth. This is due either directly or indirectly to the progressive increase of temperature. While this suffices to explain the differences between two more or less distant

points on a meridian in either the northern or southern hemisphere it does not explain the fact of the greatest average difference that exists between north temperate and south temperate regions. To form an explanation of this, further examination is necessary.

The equatorial or tropical regions of the earth, since in point of humidity and temperature they present the most favorable conditions for plant-growth, are crowded with a luxuriant vegetation. This crowding of the favorable region might be likened to the congestion by men of a rich gold-field where the opportunity of acquiring wealth is most favorable. Under such conditions the struggle for existence becomes most bitter and, as in countries overcrowded with humanity, an escape is made, when practicable, by emigration. The equatorial region, then, is a perennial fountain-head from which there is a constant stream of emigration into northern and southern latitudes. With such migration there must, under the stress of natural selection, originate and develop modifications in the migrating forms, which in course of time arise to specific rank. What these modifications may be in any particular case depends upon the complicated intermingling of the various particular conditions of climate, nutrition and competition. Further it happens that cyclical changes in the mean temperature of polar or subpolar regions have, at different times, initiated glacial epochs of longer or shorter duration. In the northern hemisphere the glaciers have extended south in Asia to the Himalaya mountains and in North America at least to latitude 39°, in Missouri. The effect of secular ice invasions upon a highly developed plant-population, could not be other than disastrous. Before the advancing glacier there must have been, among plants as among animals, a stern race for lower latitude and more congenial temperature. In this way periodic returns to the equatorial belt have been characteristic, in a general manner, of plant migration-phenomena. Evidently, under the competition and struggle of the return, natural selection would operate as before in the development of new characters and the emergence of so-called new species.

From the outline above it is apparent that a third and biological factor must be added to the two already given, if one is to explain the differences between two regions supporting distinct plant-populations. This factor, since it includes the element of time, might be called the time-factor, or better, simply "history."

The general factors in floral differences. These are, as indicated, three in number. In order of their importance they are *history, humidity, distance*. The third is geographical, the second geographical and cosmical, the first biological. The first is the most complex, upon analysis; the third is least complex. It is apparent, then, that if the explanation of such a series of phenomena as is presented by the plant-population of a natural district like the valley of the Minnesota is to be attempted, it must be through a knowledge of geographical, climatological and biological conditions. Not only present conditions but past conditions must be comprehended in such an explanation. The knowledge of past geography, past climatology and past biologic phenomena is as essential as the knowledge of these factors as they exist today. Geographical distribution of plants is therefore based upon geology as well as upon topography, upon development as well as upon classification, upon embryology as well as upon anatomy. It is a study in evolution no less than in systematics. Thus the difficulty of the problems pressing for solution is seen to be greater as they come to be comprehended. The position of an individual plant in one locality rather than in another becomes a matter for historic study, and such is the interdependence of all portions of the universe that the final explanation of what is apparently a single and simple phenomenon is after all an explanation of phenomena in the highest degree multiple and complex. In the scientific, as in the poetic sense, a knowledge of the violet is, at the same time, a knowledge of everything else.

In the present stages of our knowledge it is apparent that final explanations are remote and that inquiry must pause before its limitations. Partial answers are all that may be offered by partial information.

In naming the three factors of floral differences it will be observed that no classification of the methods by which these differences arose is attempted. Indeed examination a little more intimately will show that the three factors may be resolved into terms of the first. Distance and humidity, in their relations to the plant-population of the globe, become biological in their significance, and the distances and climate of to-day, considered quite apart from vegetation, are themselves phenomena of evolution. The geological history of the earth has had much to do with determining its topography, geography and climate. Therefore the problems of plant distribution be-

come in their final analyses, like other problems of biology, studies in evolution. The understanding of relationships is prior to the understanding of juxtapositions, separations or isolations of species, individuals, families or formations. The knowledge of embryology, phylogeny, comparative anatomy, classification, help to a knowledge of relationship. By the study of buried plants, fossil in the rocks of former ages, by the intimate observation of developmental stages in the plants of to-day, by the systematic examination and enlightened arrangement of all forms of plants and animals living within the range of human observation, and by the critical comparison of results in each of these three departments of scientific botany, lies the method of reconstructing the past history of vegetation. Such a reconstruction must perforce be general in its character, tentative in its statement of details. Nevertheless there are some conclusions that present themselves and these will be discussed in their proper place.

NATURAL VEGETATION REGIONS OF THE EARTH.

Grisebach: Under the notions of separate centers of development the most important classification of the land areas of the globe into vegetation-regions is that of Grisebach. By this writer twenty four regions are recognised, as follows:

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| I. Arctic region. | XIII. Prairie region. |
| II. Forest region of the Eastern Continent. | XIV. Californian Coast region. |
| III. Mediterranean region. | XV. Mexican region. |
| IV. Region of the Asiatic Steppes. | XVI. West Indies region. |
| V. Chinese-Japanese region. | XVII. Cisequatorial South American region. |
| VI. Indian-Malayan region. | XVIII. Hylaea, or Amazonian region. |
| VII. Sahara region. | XIX. Brazilian region. |
| VIII. Soudan, or Central African region. | XX. Tropical Andes region. |
| IX. Kalahari region. | XXI. Pampas region. |
| X. Cape of Good Hope region. | XXII. Chilean transition region. |
| XI. Australian region. | XXIII. Antarctic forest region. |
| XII. Forest region of the Western Continent. | XXIV. Oceanic Island region. |

Engler: Under the notions of general development and migration the most important classification is that of Engler. By this writer the surface of the globe is divided into four principal realms (*Florenreichen*), each of these into regions and each region into provinces. The realms and regions are as follows:

- A. Northern Extra-Tropical Realm.
- (1) Arctic region.
 - (2) Sub-Arctic, or Conifer region.

- (3) Middle Europe and Aral-Caspian region.
- (4) Central Asian region.
- (5) Macaronian transition region.
- (6) Mediterranean region.
- (7) Manchurian-Japanese region.
- (8) Pacific North American region.
- (9) Atlantic North American region.
- B. Tropical Old World Realm,
 - (1) West African forest region.
 - (2) African-Arabian steppe region.
 - (3) Malagassian region (Madagascar, Mascarenes, Seychelles).
 - (4) Lower Indian region.
 - (5) Tropical Himalaya region.
 - (6) East Asian tropical region.
 - (7) Malayan region.
 - (8) Araucaria region (tropical East Australia, New Caledonia, northern New Zealand, Kermadec and Chatham Isles).
 - (9) Polynesian region.
 - (10) Sandwich Island region.
- C. South American Realm.
 - (1) Mexican highland region.
 - (2) Tropical American region.
 - (3) Andes region.
 - (4) Galapagos region.
 - (5) Juan-Fernandez region.
- D. Old Oceanic Realm (dominant plants of more ancient types than elsewhere).
 - (1) Antarctic forest region of South America.
 - (2) New Zealand region.
 - (3) Australian region.
 - (4) Kerguelen region.
 - (5) Amsterdam Island region.
 - (6) Cape of Good Hope region.
 - (7) Tristan d'Acunha region.
 - (8) St. Helena region.

The regions of the North American continent come under two realms, as is noted above. Mexican highlands and Central America botanically belong rather with South than with North America. In the regions which are placed under the northern extratropical realm, and contain North American areas, the following divisions into provinces are established:

- (1) Sub-Arctic, or Conifer region.
 - (a) Northern European province.
 - (b) Northern Siberian province.
 - (c) North American Lake province. (Described as sub-arctic and alpine, uniting on the north with the Arctic region and on the south with the Pacific and Atlantic regions of North America. Three zones are recognised—I, the *Algonquin zone*, lying between Hudson Bay, Newfoundland and Lake Superior, characterised by *Thuja occidentalis* and *Taxus canadensis*; II, *Athabasca zone*, bounded on the south by a line from

Hudson Bay to the Rocky mountains and characterised by *Pinus banksiana*, *Abies balsamea*, *Picea nigra*, *Larix pendula*, *Picea alba*; III, *Canadian zone*, not clearly delimited, lying southward of the other two and between them, including Manitoba, western Ontario, northern Minnesota, Wisconsin and Michigan, characterised by *Pinus strobus*, *Pinus resinosa* and *Abies canadensis*.)

(2) Pacific North American Region. (Reaching from the sea to the foot of the Rocky mountains, and south to the Mexican highlands.)

(a) Californian coast province, between the Coast Range and the sea. Characteristic conifers, *Sequoia sempervirens*, *Pinus insignis*, *Pinus muricata*, *Pinus tuberculata*, *Pinus coulteri*, *Picea bracteata*, *Torreya californica*, *Cupressus macnabiana*, *Cupressus macrocarpa*.

(b) Oregon province. (Including area west of Cascade mountains. Four zones are recognised; I, *Kaloshen zone*, to 52° north latitude, characterised by *Thujopsis borealis*; II, *Douglas zone*, to 43° north latitude, characterised by *Abies douglasii*; III, *Umpqua zone*, between 42° and 43° north latitude, characterised by *Cupressus fragrans*; IV, *Sierra zone*, characterised by *Pinus lambertiana* and *Sequoia gigantea*.

(c) Rocky-mountain province. (Characterised by *Pinus flexilis*, *Pinus monophylla*, *Larix occidentalis*, etc.)

(d) Colorado province. (Reaching from Cascade to Rocky mountains, open country.)

(3) Atlantic North American region.

(a) Appalachian province. (The forest district of the Atlantic North American region, south of the lake province includes three zones. I, *Allegheny zone*, characterised by *Pinus inops*, *Pinus pungens*, *Pinus rigida*, *Picea fraseri*, *Juniperus virginiana*; II, *Carolina zone*, including New Jersey, Delaware, Maryland, Pennsylvania, Virginia, Georgia; III, *Mississippi zone*, including the forest district of the Mississippi valley.)

(b) Prairie province. (The western central and central prairies of the Atlantic drainage, including also the Saskatchewan and Assiniboian prairies of Arctic ocean drainage.)

Drude: The most recent and most generalised division of the earth into botanical regions is that of Drude. By this writer three main regions are recognised. These are:

- A. Northern realm.
- B. Tropical realm.
- C. Southern realm.

These three principal regions are subdivided as follows:

- A. Northern realm.
 - (1) Arctic region.
 - (2) Northern region.
 - (3) Middle North American region.
 - (4) Mediterranean-Oriental region.
 - (5) Lower Asian region.
 - (6) East Asian region.
- B. Tropical realm.
 - (1) Tropical American region.
 - (2) Tropical African region.
 - (3) Indian region.
 - (4) Malayan-New Zealand region,

C. Southern realm.

- (1) Andes region.
- (2) South African region.
- (3) Australian region.
- (4) Antarctic region.

None of these regions are very sharply limited but are defined so as to indicate the transitions. Of Realm A, the last four regions are tropical as well as northern in their character. In all regions of Realm B there are to be observed, especially at higher altitudes, elements transitional between A or C. In Realm C, only the fourth region is comparatively uninfluenced by the plants of Realm B.

The region of the Minnesota valley, according to the classification of Drude, lies partly in the Middle North American region and partly in the transitional region between the Middle North American and the Northern. Its principal characters are derived from the commingling of a group of north bound generally endemic plants with a south-bound group of less generally endemic plants. Its old-world character is given rather by the influence of the Northern region—and this influence is most distinctly felt in the upper latitudes of the valley—than by the southern. As will be shown later, the species of plants common to the Minnesota valley and to the old world are generally more northern than southern in their North American distribution.

General position of the Minnesota valley as a botanical district. From the different classifications given it will be seen that the Minnesota valley, in the botanical sense, is first of all, northern-extratropical; second, North American; third, middle North American. This order corresponds with the geographical order. It will now be necessary to note the general methods by which the melange of plants found growing in such a region becomes possible.

Greater compositeness of the Northern realm. In any of the classifications of the botanical regions of the earth it will be noted that a greater homogeneity is to be seen in the regions of the northern hemisphere than in those of the southern. The reasons for this difference are both geographical and geological. The Antarctic region consists of a series of isolated areas such as Kerguelen, New Zealand, Patagonia and the lower Cape of Good Hope district. The Arctic region on the other hand consists of a compact circle of land surrounding the unknown polar area and broken only by narrow inlets such as Berings straits or Davis strait. Spitzbergen is the only rela-

tively isolated island in this region and its distance from Nova Zembla on the one side and Greenland and Iceland on the other is slight compared with the distances between Kerguelen, the Cape, Terra del Fuego and New Zealand and Chatham Islands. The distances being less between the continental or island areas of the northern hemisphere than between such areas in the southern, we are prepared to expect smaller differences between regions on different meridians of the northern than in the case of regions similarly situated in the southern extratropical regions. The facilities for migration and commingling are evidently much more favorable along parallels of latitude in the northern than in the southern hemisphere. It happens, then, that while in the southern hemisphere the Antarctic region is the only one including land in both eastern and western hemispheres, in the northern hemisphere the next region south of the Arctic region is likewise common to both eastern and western hemispheres. This region is the Conifer region of Engler and the Northern region of Drude. Further, in the northern hemisphere there is from Arctic circle to the equator a generally greater latitudinal mixing of plants than in the southern and this is apparent even when there is too little of it to permit grouping the regions affected under the same division. For example, as pointed out by A. Gray and later by Miquel, the Japanese-Manchurian region presents striking resemblances to that of the Appalachians; the Californian and Mediterranean-Oriental have much in common, and the Prairie province of North America is not unlike the Central-Asian steppes in its plant-population. Isolation of regions is therefore characteristic rather of the Southern than of the Northern realm and the difference in degree of isolation has had much to do with the differences which have arisen between the characteristic elements of the Northern and the Southern botanical realms.

Beside the geographical character of the northern hemisphere certain important geological characters have had an interesting effect upon the mixing of the plants in the Northern realm. First should be noted that the evidence, geological and biological, is in favor of supposing a closer union of Alaska with eastern Asia, in Tertiary times. The sharp distinction between the plants of Greenland and the Scandinavian peninsula compared with the almost imperceptible differences between the floras of Alaska and Kamtschatka or Saghalin is interestingly explained by this ancient continuity between the

two continents. Second, it is important to observe the effect of the profounder glaciation of the northern hemisphere than of the southern. The largest continuous area of glaciation is that of the North American continent. Here it comprises most of the land east of long. 97° W. of Greenwich and north of lat. 42° , although it extends south to 39° . The next largest is the area of western and central Europe where it comprises the territory east of western Russia and north of Poland and Germany. In the eastern hemisphere it extends south to 51° N. lat., or to a region of temperature approximately equal to that of southern Illinois, in North America. Other drift-areas in the northern hemisphere, such as those of the Alps, the Pyrenees, the Carpathians, the Himalayas, the Cordilleran range or the Tennessee mts. are more strictly local, but have played their part in the commingling of plant forms. The effect of the glaciation of the North American and western European areas has been productive of a distribution of distinctively northern plants ("*glacial plants*") southward, as one of the more simple results. More indirectly it has been productive of diversity in the flora of the northern extra-tropical regions by the forced origin of new forms during the earlier southward movements and the succeeding northward returns. As has been noticed by many writers this diversity is greater in the western hemisphere than in the eastern, evidently on account of the different continental positions of the principal mountain ranges. In North America the Rocky, Sierra, Coast and Appalachian systems all run from north to south and present to north-bound or south-bound plants no barrier, but rather an appreciable assistance by way of providing different altitudes at which acclimatisation might progress most comfortably. In the old world, the Pyrenees, Alps, Apennines, Carpathians, Caucasus and Himalaya mountains maintain a generally east and west direction, and to plants migrating southward before the glaciers would have presented an impassable barrier. Decimation of old-world species would thus result in the conditions of difference as seen to-day between the old world and North America, where the migrations were not opposed by the topography of the country. In both the proximate and remote movements of plants under the influence of widespread continental glaciation, the higher mountain ranges, by presenting a wider range of temperature in latitude, to be compared with the range of temperature

in latitude, would favor the southward and northward movements more distinctly than would the lower mountain range. The writer has shown elsewhere that, of genera which reach their maximum number of species in Canada, about twice as many species are distributed south to lat. 30° , and thereabouts, in the Rocky and Sierra ranges as in the Appalachian.

PRESSURES AND TENSIONS.

General considerations of equatorial pressure. We have already seen that the plants of tropical regions may be considered as striving to migrate to higher latitudes. In this way a general pressure of plant-population is set up along the central regions of the earth's surface. This pressure diminishes as one approaches the equator, but becomes greater through cumulative additions as one passes into extra-tropical regions. A similar north and south polar pressure of population is set up by the plants of northern and southern regions. It thus happens that two lines of tension might be run around the earth in northern and southern extra-tropical regions, and these lines would be marked by transitional floras and by more or less organised competition between the northern and southern forms. Under the positive equatorial pressure opposed by the negative polar pressures a segregation of metaspermic plants would take place in such a way that gradually the weaker and older forms of plants would find themselves pushed out between the interstices, as it were, of the stronger, and would thus be compelled to content themselves with conditions of existence progressively more difficult. In the northern hemisphere then, the Monocotyledones form a large percentage of the northern, and the Metachlamydeæ a large percentage of the southern species. For the Monocotyledones as a group are lower in the scale of organisation than the Archichlamydeæ or Metachlamydeæ. The result of what I have named here equatorial pressure has this peculiar effect upon the construction of plant-zones—or to employ a different comparison, plant-armies—that the weaker are always forced to fight in the front. In the case of the trees of the Archichlamydeæ in North America, those with undivided leaves are more northern in general than those with divided leaves. The range of *Populus*, *Betula*, *Salix*, *Acer* is in general more northern than that of *Fraxinus*, *Gymnocladus*, *Gleditsia*, *Sophora* or *Lysiloma*. But the compound leaf is a tropical character, as indicated by Grisebach, and marks a development from, and improvement over the simple leaf. It is important

to notice that this state of tension which has been described, while of a purely biological nature, serves to produce results quite analogous with similar physical tensions. In the mutual pressure of solids the liquid that may be contained in their pores is crowded to the surface of the mass. In the same way we may figure to ourselves the weaker plants of a formation crowded to its periphery where they meet and struggle with the weaker plants of an adjacent formation. This is excellently seen in the line between forest and prairie in such a district as the Minnesota valley. It is not the characteristic grass of the prairie that grows close up to the characteristic tree of the forest, but between the two there is a zone of plants not perfectly established in either forest or prairie. This transitional formation between forest and prairie is generally composed of species weaker than the characteristic plants of either formation.

Movement of tensions. Again it is apparent that under the present climatological conditions of the earth the equatorial pressure must increase and that the polar pressure must diminish. Under such a generalisation of plant-dynamics it becomes apparent that with all the complex interdependences and competition of individuals with individuals, species with species, formations with formations there is, more fundamental and more general, a competition between the centrally and the distally located individuals, species and formations. Further it is apparent that the line of tension as it has been termed will progressively move to higher and to higher latitude. Thus as the cumulative equatorial pressure increases while the cumulative polar pressure at the same time decreases, the line of tension, other things being equal, will manifest progressive acceleration in its movement from lower to higher latitudes. A number of conditions intervene to retard this movement of the line of tension and in consequence it is less rapid, actually than hypothetically. Among these retarding conditions are the increased difficulty of acclimatisation of north-bound plants as they extend further northward and the increased solidarity and consequently increased resistance of northern plants. And beside these two general factors in the retardation are the factors in the special cases as they might be named—the various conditions, topographical, nutrimental, biological, which confront each individual or species as it increases its range in any direction. The most important visible results of these retarding influences are to be looked for in the changes of

habit of growth or habit of nutrition in the plants in question. Under these retarding influences the gradual development of monocarpic into polycarpic forms, of herbaceous into shrubby and of shrubby into arborescent types may be brought in evidence. As the distribution of the herb is more rapid than that of the shrub and the distribution of the shrub more rapid than that of the tree, any influences that induce the emergence of shrubby or arboreal characters may be deemed distinctly retarding in their general effect. That such a difference of mobility actually exists is derived from the testimony both of experience and of *a priori* reasoning. The adventive plants and the escaped plants in any region are always in large part herbaceous, because it is more easy for plants of small size and rapid maturation to gain a foothold than for plants of large size and slow maturation. But in the internal competition for light—the important energising force of plants—the emergence of the shrubby or arboreal character may be expected and precisely as it becomes more prominent—unless other modifications arise to maintain the general equilibrium—will the rate of distribution decrease. In general we see that the higher forms of archichlamydeous trees such as the linden, the maple, the walnut, are heavier seeded than the lower forms such as the willow or the poplar. The increased size of the seed is necessary to provide for the increased difficulties that surround the establishment of the seedling. So thus it is evident that the development of the arboreal type exerts a retarding influence upon distribution.

Fluctuation in tensions. Fluctuations in equatorial pressure may arise in several ways. Beside the general acceleration due to the increased extension of the central groups of species and formations and the general retardation due to the causes mentioned, there will arise fluctuations which may originate in widely diverse conditions. These conditions may be topographical, climatological, geological—in the widest sense—or biological. The erosive action of streams, by reducing the general altitude of a tract of country, brings about alterations in the rates of plant movement over such a tract. And by the reduction in altitude, changes in annual rainfall, annual temperature, mean direction of winds, and in maxima or minima of each of these, are brought about. Or again secular changes in the general level, due to orogenic movements in the crust of the earth, may induce greater or less fluctuations in the rate of movement of the line of tension, as they are

themselves of greater or of less magnitude. This effect may be either mediate through the modification of climate or immediate by the alteration of topography. And still again, the countless variations in those conditions which, from their complexity, are given the name of biological, have marked and ample influence upon the general rate of progression. The entrance and acclimatisation of some alien species of plant or animal, the activity of man in burning or felling the forest and in tilling the meadow-land or prairie, the movement of herds of ruminating animals, such as the now almost extinct bison, the flight of migrating birds, invasions of destructive insects or of parasitic fungi—all these and many other kindred phenomena may and do affect the movement of the line of tension, by distributing seeds, destroying rival plants, introducing new competitors and altering the dynamic equilibrium either generally or locally, and either continuously or discontinuously.

Influence of equatorial pressure on habitat. The general existence of equatorial pressure, of tension-lines and the laws of the progression of the tension-line, having now been noted briefly, it remains to observe what is the influence of equatorial pressure on the selection of habitats. Under the relentless ejection of the weaker plants from the more favorable localities, and the increasing solidarity of the stronger plants in characteristic formations, it is apparent that greater and greater specialisation of form and physiology, together with increasing specialisation of habitat, must arise. It is therefore interesting to observe that the highly special habitat is commonly occupied by the highly specialised plant. The epiphytic orchids which have accommodated themselves to a condition considerably removed from the original aquatic condition of plants, are themselves members of the highest family of the monocotyledons. The cacti of the arid regions, the dodders that entwine themselves about the stalks of other plants, the bladderwort which floats upon the surface of stagnant pools and feeds itself with minute crustacea that it has learned to capture in its bladdery weirs, are all plants high in their respective divisions. On the other hand the cat-tail (*Typha latifolia*), one of the lower plants of its division, is less specialised in habitat. The least specialised habitat, the aquatic, is peculiarly the region of the lower groups of the Metaspermae. A most general result then, of the equatorial pressure is seen in the specialisation of habitats. This is a result of the competition following the ejection of the weaker.

Again the equatorial pressure has an indirect influence upon habitat, under the law termed by Herbert Spencer the *multiplication of effects*. As one plant is forced into a new and generally poorer habitat, to which it becomes more or less exactly accommodated, it exerts a constantly widening influence upon other plants some of which, already established in its new habitat, are brought into a new phase of the struggle for existence by the recent addition, and others competing for the abandoned territory are in turn exposed to the modifying influence of natural selection. Thus it happens that the general effect of what has been termed equatorial pressure has an incalculably wide and profound influence upon the plant physiognomy of any district. In this analysis it will be seen that general answers—partial, it is true, but capable of extension—are provided for some of the questions propounded in the opening pages of this chapter. Conditions in the Minnesota valley must be explained by conditions elsewhere. This area in the line of tension must be studied with an eye directed towards the dynamic centers which make it possible for such a line of tension to exist.

Secondary longitudinal tensions. Besides the general line of tension to which notice has been directed there exist at least six other principal secondary longitudinal tension-lines in the North American continent. The influence of these is felt but slightly in the Minnesota valley, in comparison with the lateral line. The origin of the six principal longitudinal tensions is to be referred to the three meridianally extending mountain ranges that arise in the eastern, western-central and western regions of the continent. Between the Sierras and the Pacific coast occurs the western tension-line; between the Sierras and the Rockies what may be termed the Sierra and western Rocky mountain tension-lines; between the Rockies and the Appalachians, what may be termed the central and Appalachian tension-lines, and between the Appalachians and the Atlantic coast, the eastern tension-line. The origin of these tension-lines is precisely similar to that of the main continental tension-line that runs in a direction generally east and west. They arise from the fact that the alpine summits and elevations serve for southward extensions of the northern group of plants, and these northern plants are brought into competition with the plants of lower levels which are crowded laterally as well as longitudinally, and tend to expand their areas of distribution from meridian to meridian

as well as from parallel to parallel. As there was before to be distinguished a progressive movement, with attendant accelerations and retardations, to higher latitudes, so here there is a similar movement towards higher altitudes, and as fluctuations arose before in the rate of progression, so, too, similar fluctuations will here arise from similar conditions. In general these longitudinal tensions are to be studied under the laws of the lateral tensions.

So far as concerns the Minnesota valley the central tension-line lies far to the west of it and this fact will be seen to have an evident effect upon its floral population when, in the next chapter, more particular and detailed attention is given to the character of that population. And so, too, the Appalachian tension-line lies far to the east of the valley. Its influence like that of the central tension-line is slight. Indeed the influence of these two longitudinal tensions is felt only indirectly in a region so remote from either as is the valley of the Minnesota. Such indirect influence is however appreciable, and is apparent on the one hand in the presence of plants like *Collomia* and on the other by the presence of the different species of *Rhus*.

Minor tensions. In an area, considerable in extent and diversified in topography, as is the valley of the Minnesota, there are to be distinguished what I may be permitted to term *minor tensions*. By this there is not meant the forest and prairie delimitation, for that is to be referred in large part to the principal lateral tension, developed by equatorial pressure. The various topographical features of the Minnesota valley, with its gorges, glens, vales, meadows, hills and headlands, bring about slight but distinguishable segregations of floral elements. Between meadow and bluff there exists a minor tension-line, between swale and knoll on the prairie, between hill and ravine in the forest there are to be discovered such minor tensions. But just as these minor tensions are due to slight differences, so too their progressions, accelerations, retardations and fluctuations are so variable that their very existence becomes a matter principally of averages. Nevertheless their presence may be determined in the field or *a priori*. The influence of these minor tensions on habitat is great, but it is after all an influence transmitted from the more general continental tension and may as properly be referred to the latter. Upon the physiognomy of the district these minor tensions have a conspicuous effect and to their presence may be ascribed much

of the variety of floral elements met with in a morning walk over any portion of the basin.

The influence of these minor tensions is most interestingly portrayed in the modifications through them of the general lateral tension line. For example the irregular contour of the limiting line between the forest and the prairie is due in part to the presence of minor tensions, either positive or negative, along the general line, and by means of these minor lines the exact outline of the forest edge is, in part, determined. In explaining the contour of the forest line it is apparent then that we must consider a number of different forces acting both directly and indirectly, in varying degrees of directness or indirectness. The more direct influence of the relative humidity, elevations, soil compositions, exposure to light, etc., are accompanied by those indirect influences which appear most distinctly in the tensions. As in the Minnesota valley from New Ulm to Montevideo the south bluffs are more densely wooded than the north—apparently because their exposure to the desiccating action of the sun's rays is less—so in less extended areas one may recognise the effects of the minor tensions in determining the physiognomy of smaller and still smaller areas. This group of tensions may then, for each degree, be reduced to more and more special cases, and ultimately appears in the form of mutual competition between adjacent individuals of the same, or different species, or even between differently situated organs of the same individual. By synthesis of competitions, together with progressive alterations of climate, topography, distance and the rest, the tensions may be considered to arise; and by analysis of the various degrees of tension we come back to individual competitions and to more and more definite geographical influences.

General division of the world into botanical realms. From the considerations given it will be seen that a yet more general division than that of Drude may be proposed. The two great realms are:

(A.) The Central Realm.

(B.) The Distal Realm.

The valley of the Minnesota is upon one of the transition lines between these two principal realms.

OUTLINES OF METASPERMIC HISTORY IN THE NORTHERN HEMISPHERE.

Emergence of metaspermic forms. Leaving aside the probable origin of metaspermic plants in point of development from

archetypal Archegoniatae, it is possible from the evidence of palaeontology to calculate the general period of their emergence. In rocks older than those of the Lower Cretaceous remains of metaspermic plants are exceedingly rare and doubtful. This indicates an origin somewhere in the Jurassic period, although by some the time of their appearance is placed as far back as the Devonian. During the Lower Cretaceous several highly developed monocotyledonous or archichlamydeous plants must have begun the winning struggle with the less highly organised ferns, club-mosses, cycads and conifers of older geologic time. In the Potomac formation of the Atlantic United States, as studied by Fontaine, several remains of metaspermic plants intermingled with those of archaic varieties of ferns and cycads have been discovered. Through the Cretaceous period the metaspermic plants developed with rapidity, and in the Upper Cretaceous had established themselves as the dominant forms over a considerable area of the earth. The researches of Heer, Lesquereaux and others in the North American continent have revealed the vestiges of an ancient flora, considerably diversified and of a highly modern aspect. During the Cretaceous period the smaller extent of the North American continent, its isolation and attendant division by the Cretaceous Mediterranean which extended from the present boundary of the Gulf of Mexico through the Rocky mountain region to Alaska, may have had much to do with the rapid development of metaspermic types. During this time the Californian and Sierra region formed a separate continent, and on the other side of the sea lay the Atlantic continent, extending south about to the present region of the Ohio river. Evidently during this time and in succeeding ages, the climatic conditions varied greatly from those of to-day, for in the Cretaceous and later Tertiary rocks of Greenland, Spitzbergen, Nova Zembla, Point Barrow, the Mackenzie islands and of other localities far within the Arctic circle, there are found the remains of a flora characterised by large leaved palms, exogenous plants and even cycads, thus giving a distinctly tropical aspect to the vegetation of circumpolar regions. This tropical character persisted until comparatively recent times, when by the great elevation of the polar regions and by probable changes in oceanic currents the conditions became those of the glacial epoch, since which time there has been a moderation in the temperature of the northern hemisphere, but by no means a return to the Tertiary benignity.

Character of the Cretaceous flora. As has been shown in the preceding chapter the main gorge of the Minnesota river has, in part, existed since the times of the Upper Cretaceous, and was possibly formed in even an earlier geological epoch. The drainage might have been and probably was in the opposite direction at that time, but from the presence of Cretaceous deposits in eroded portions of the Shakopee limestone we know that at least the lower portion of the gorge was in existence before the formation of these deposits. At that time, as shown by the remains of the Cretaceous flora of the Minnesota valley which have been collected by Lesquereaux from the Cottonwood valley localities, the basin supported species of figs, sequoias, or "big trees," pines, laurels, magnolias, persimmons, poplars, willows and others. Of the twenty-eight species described by Lesquereaux in his *Cretaceous Plants of Minnesota*, two are Conifers—one *Sequoia* and one *Pinus*—two are metachlamydeous and twenty-four are archichlamydeous. This is too small a collection to generalise from, but other collections of Upper Cretaceous plants throughout the region of their occurrence in North America indicate the same general percentages, so much in favor of supposing archichlamydeous plants to have been in a greater preponderance among the total Metaspermæ than to-day. Regarding the physiognomic characters of the flora it has been pointed out by Lesquereaux in 1874 that the indications are rather of a low-shore or morassic habitat than of a distribution on drier hills. Under the law of tensions we should expect to find the emergence of the newer types upon just such territory, and the more favorable land would doubtless have been occupied by the older types of plants. This seems to the writer the true explanation of the apparent suddenness with which metaspermic plants emerge in the Cretaceous. The geologic formations in which they are preserved are fit to preserve also the coniferous or cycadean elements, if they were conspicuously present. That these are less abundantly represented has generally been supposed to indicate a preponderance of metaspermic elements in the general flora. The facts seem, however, to indicate quite the reverse of this, and properly interpreted enable us to form a very different picture of the Cretaceous plant-physiognomy. Under the law of ejection of the weaker the sea-shore would present a general tension-line and here would be gathered in narrow strips, but extending somewhat up the rivers and distributed in the marshes, the newer and struggling Metaspermæ.

In such a region of high competition specific and ordinal characters would have progressively appeared and the littoral regions of the Cretaceous ocean, both east and west, would have been fringed with the more highly specialised types of plants. But the interior would more probably have been occupied by solid masses of coniferous, fern-like and club-moss-like plants. The general physiognomy then of Cretaceous regions must have been much more distinctly coniferous than that of Northern Minnesota at the present time. The proximity of the fringe of metasperrmic plants to the beach or estuary formations in which their remains are preserved as imprints in the Cretaceous sandstone together with the remoteness of the solid masses of coniferous plants from the same formations is the reason for the preponderance of the former as fossils.

The Tertiary flora. In Tertiary times, however, the Metaspermæ had gained much ground, although they were probably not so prevalent as they are to-day, nor had the dispersion of the older coniferous flora reached such an extent as under modern conditions. During at least the Miocene period of the Tertiary the temperate climate of the Arctic regions persisted, and during this time a considerable mingling of plants took place over the northern hemisphere so that the influence was felt by the plant-populations even to the equator. Engler has interestingly discussed this Tertiary migration, and, in his chart illustrative of it, the principal lines are indicated. In the old world the movement extended to Arabia and Abyssinia, by way of the central Asian route. At this time the central Asian region was occupied by a large lake and a chain of such great lakes extended throughout a large portion of the middle Mississippi valley in North America. During this period the western and eastern portions of the North American continent, now connected by the land area which in great part replaced the Mediterranean ocean of the Cretaceous, were affected by immigrations from the northwest and the characters of the Japanese-Chinese region and the upper North American were doubtless more similar than they are to-day. For example the curious ginkgo tree now isolated in the Japanese-Chinese region was distributed also over portions of Europe and Canada. This Tertiary mingling had a profound effect upon the development of monocotyledonous and archichlamydeous types. In both groups many arborescent forms originated. While to-day there is not a single monocotyledonous tree in the region of the Minnesota valley, there were then, in adjacent

regions where Tertiary deposits are found, and quite certainly therefore in the valley, several varieties of palms. The archichlamydeous arboreal types reached a high degree of expansion and some of the noblest trees—such as the tulip-tree (*Liriodendron tulipifera*), for example—which are now of restricted North American range, were then widely distributed around the northern hemisphere. This middle Tertiary time might be called the *Age of Archichlamydeæ* just as the present age, succeeding the glacial epoch might be termed very appropriately the *Age of Metachlamydeæ*. In North America the Tertiary movement extended from the polar regions at least to southern California and probably to Georgia. Under the competition and tensions of such a wide-spreading southward movement the development of many of our modern genera took place and even of several of the more common modern species of Monocotyledones and Archichlamydeæ. In this period, or more probably earlier, the newer types of the Metachlamydeæ with their highly modified flowers and fruits began to emerge.

In a general sense then the monocotyledonous and archichlamydeous plants of the Minnesota valley derive considerable explanation from the consideration of Tertiary comminglings just as do the metachlamydeous forms from interglacial and post-glacial comminglings. Even in Tertiary times the monocotyledonous trees must have been sharply attacked by the robustly developed archichlamydeous forms, but it was not until the glacial epoch that their hold on the region of the Minnesota valley was finally destroyed.

The post-Tertiary movement. After Tertiary time the elevation of the northern part of the North American continent and of the western part of the European continent, together, very probably, with the secular inclination of the earth's axis, brought about the gradual glaciation of these areas. Not only once did the glacier plow its course southward in the northern hemisphere, but certainly several times. Two principal epochs of glaciation are recognised by American glacialists—the earlier one in which the terminal moraines reached as far south as 39° N. lat. and the second, during which the ice moved to a much less distance and piled up the morainic area of the lake region in Minnesota near lat. 45° N. This morainic area forms the northern boundary of the Minnesota valley. Under the rigorous conditions of the advancing continental ice-sheet it was necessary for plants either to migrate

or to perish. Those for any reason well-fitted to migrate were selected for re-establishment at successively lower latitudes. Under the relentless overwhelming of the epoch large numbers of plants were ejected forever from the Minnesota valley, others were so modified in their movement south and return to the north that they appear to-day in new specific forms, while a large number of new forms, developed principally in the group of the Metachlamydeæ, have been permitted to gain a foot-hold. The palms and sequoias have been driven out of all this central North American region, the palms to maintain a precarious existence in tropical or insular regions, the sequoias to their last stand in the limited area of the Sierras, where they still continue their losing fight as the remnants of an almost extinct race of vegetable giants. The enormous size of the "big trees" of Calaveras county, has, however, one interesting word to tell us of the northern forests that were once their home. The very fact of their spreading their leaves to the light at a height of 300 feet above the surface of the earth gives us a hint of the tremendous extent to which solidarity of the Tertiary coniferous forests had progressed and permits us to understand how stern had become the competition for light in view of which such bulk was necessary for the preservation of the species. Just as in the formidable defensive armor of some extinct armadillo one may read somewhat of its struggle with its enemies, so in the one hundred meters of solid trunk and in the massive girth of a living *Sequoia gigantea* one may learn of its struggles in the ancient forest of Cretaceous and Tertiary times, when its allies and competitors were alike more numerous.

Of all the plants which went south before the first invasion of the glacial sheet none showed greater capacity for variation and improvement than the ancestral forms of the modern dominant family of the *Compositae*. Such plants as, by permitting their seeds to fly before the prevalent north winds or to attach themselves to the fur of migrating bison, mastodons or other animals, had achieved a lower latitude were of course assisted upon their return by the same characters. During interglacial time they doubtless established themselves upon the till of the Minnesota valley and underwent comminglings such as those of to-day. As calculated by Winchell from the study of abandoned gorges of the Mississippi valley, the interglacial period was approximately 9,750 years in length and this period as stated by the investigator named, would have

sufficed for the development of a characteristic flora. Then the second great southward movement of the ice began, during, and perhaps late in which, the moraine of the Lake Region of Minnesota was deposited and the debris piled up in the Leaf hills to a level of three hundred and fifty feet above the surrounding country. The length of time that this glacier persisted in its southern extension is not known, but since its recession it has been calculated by Winchell from a study of the gorge of the Mississippi from St. Anthony Falls to Fort Snelling, and of the observed rate of recession of the falls, that a period of 7,800 years has elapsed. It is not certain that the proximity of the glacier even at its intermediate extension of the lake-region moraine would have prevented a plant population from establishing and maintaining itself in the valley of the Minnesota. To-day, in the Alps, one finds flowers blooming within a few feet of a glacier, and in Alaska it has been observed that plants of even a large size may continue their growth upon a slowly moving moraine. It is probable, however, that the adjacency of so large a body of ice, through its influence upon humidity and temperature, had an indirect influence upon the physiognomy of the Minnesota plant-population.

Results of the epoch of glaciation. The results of this widespread glaciation of the northern portion of the North American continent, in its effect upon plant-population in the Minnesota valley from the time of glacial retreat to the present, may be classified under two general categories. First, the effects of the glaciation upon the soil, topography and climate of the valley itself must be noted, and, second, the effects of the glaciation upon the plants, in so far as concerns modifications of types or novelties of distribution or habitats, are to be distinguished.

Under the first division of the subject the most important result is doubtless the great mixing of soil-components so as to form the characteristic clays, sands or gravels of the till. Since a large sheet of Cretaceous deposits was torn from the surface of the older rocks by the energy of the glacial advance the subsoils of the till region contain considerable of the Cretaceous elements. They are rather rich in calcareous, magnesian and silicious elements. The thorough kneading together of the various constituents has produced a soil somewhat generalised in its chemical character, and this soil by subsequent modifications presents from place to place a wide

variety of conditions. It becomes, therefore, both a condition and, to some extent, a cause of the diversity of plant-population. From the bare gneissic rocks of the Granite Falls district one may find in the valley all sorts of variations to the peat-bog soil of the Mankato and Kasota districts. Here sands or gravels in various proportions, there clays of different compositions or mixtures of sands and clays give a great diversity to the soil-surface of the basin. As, through water agency, the soil becomes more and more analysed and segregated as one leaves the general prairie level in passing down some channel, so in the main gorge at different places where different kinds of selective action have progressed and where the cumulative selective action of tributary streams is felt, may be found the maximum of variety in passing from one area to another. It is possibly due in part to this relative homogeneity of the prairie soils and relative heterogeneity of the bottom-land soils that the prairie itself supports relatively a more homogeneous plant-population than the bottom-lands. The grasses, composites, pulses, polygalas, phlox and sedges of the rolling prairie constitute after all a rather small percentage of the total population of the valley. To contribute to this result not only past glacial actions, but present, continuous activities of rain, wind and temperature have played their part. It is, however, not incorrect to attribute, in part, the difference between the upland and lowland characters, to the glacial invasion.

The topography of the valley is evidently in great part due to the subsequent action of the various forces of nature upon the general mass of till which was deposited in a sheet averaging more than two hundred feet in thickness over the older surfaces of the basin. The original aspect of this drift-sheet was doubtless somewhat undulating and under the weathering and erosion of the last 7,800 years it has come to present its modern aspect. The hills have become rounded, the streams have cut their gorges and deposited their silt in the form of alluvium, the lakes, formed by the disturbance of the old drainage, have sometimes persisted, with, however, reductions of original size in varying degree, and have sometimes disappeared through the cutting and draining action of their outlets or through the silting up of their inlets. Thus many level meadows have been formed and the production of such meadows from older lakes may be seen going on to-day. In this way, habitats are provided for aquatic plant-immigrants,

for those that prefer the muddy or sandy shore, or for those that dispose themselves in the running water of the outlet or inlet streams. And as the topography has had its influence upon the distribution of the plant-immigrants so they in turn have had their reciprocal influence upon topography. By choking the ponds with generation after generation of individuals they have hastened the disappearance of the water and have then themselves either generally disappeared to make room for plants better fitted for the drier condition or have adopted more terrestrial habits. And by clothing the hillsides or shading the sides of ravines they have, both directly by their interposition, and indirectly through their influence upon relative humidity, modified the erosive activities of the water or the desiccating activities of the wind. As a foundation for all these complex, interdependent phenomena it is clear that we must assume the original surface of the till when the valley was abandoned by the ice-sheet in its retreat towards the pole. Both the general features of the topography and many of the special ones are therefore glacial in their proximate analysis. It must not be forgotten, however, that preglacial forces and conditions, by hollowing out the ancient gorge of the Minnesota and by determining its sea-level at different points are of similar importance in the final comprehension of the general and special topography. But, so far as concerns the more modern times it is clear that a base-line for historic discussion is very properly derived from the period when the glacier left its mass of undulating till to be worked upon by the rains, sunshine, winds, plants, animals, rivers, temperature of the succeeding years.

Under the second division of the subject—the action of the glacial period and its results as shown in the modifications of plants—there is little that need be added in so general a discussion. It has already been shown how distribution, under conditions variably favorable, will induce pressures and tensions; how these tensions will themselves move from one position to another; how the weaker plants are ejected to the periphery of formations where they enjoy less favorable conditions of nutriment, perhaps, but more favorable conditions of competition; how the tensions and competition are modified by various direct and indirect forces, chemical, physical or biological; how in the southward and northward oscillations of a plant-population, modifications of tensions, types, localities, habitats, physiology would ensue, and how the recurrence of glacial epochs accentu-

ated the characters which had begun to emerge under previous glacial epochs. It has been shown how the Metachlamydeæ have been developed under the movements of plant-populations attendant upon glacial encroachments. It has been indicated how such a family as the Compositæ have derived their modern supremacy in the Middle North American region from their ability to move quickly among the flying or advancing plant-migrants. It remains to indicate the effect of resistance, topographical, climatic and biological, to such movements. As a group of plants began to move southward before the glacier they would find themselves opposed by rivers, hills and plains. Those at home on the hill would be interfered with by the plain, and *vice versa*. Again, the climate would doubtless change from latitude to latitude, although perhaps the general northern advance of the ice, by modifying the climate, would assist the south-bound plants by presenting conditions progressively more difficult for the south-established plants with which the south-bound plants were forced into competition. Lastly, a constantly new group of aboriginal plants, already established in southern regions, would oppose the entry of the south-bound forms to their territory. Thus any characters whatever which might contribute to the strength of the species would have been selected for perpetuation. Not only the pappus of the dandelion flower-fruit and the hooks of the *Bidens* achene would be seized upon for the protection of the species from extinction, but the shortening of the floral axis, the grouping of leaves to best catch the light, colors that might attract some insect allies, height, the increase or decrease in the size of the seed, all would, if advantageous, be imprinted on the species, and variations would ultimately arise sufficient to justify the grouping of the modified plants in categories different from those of the original plants. Under such stress it is easy to see how the raceme of flowers became shortened into the disk-like head, how the heads at first in different planes, or racemosely arranged, came to be compacted into the corymboid group of inflorescences, such as that of *Solidago rigida*. In every way, the general passage from indefiniteness to definiteness, in structure, form, physiology, habitat, distribution, would be a result of the enforced migrations. As factors in the evolution of plants we must admit that, for the northern hemisphere in particular and for North America most particularly, the ancient and repeated glaciations were of the utmost importance.

Conditions of the present. Clearly all of the phenomena of the distribution of plants in the valley of the Minnesota are now discovered to be phenomena of evolution. Does this evolution go on before us? The question scarcely needs an answer, so evident is it that such forces as have always been at work in the distribution of plants are at work to-day. Certainly there is not the advancing glacier of 8,000 years ago, but in other ways the struggle is directed so that pressures and tensions are set up throughout the region of our study. The reëchoing influences of the past, the constant struggle of the present—these are the two deeper factors of distribution that demand our careful investigation. To-day we find this struggle organised under the different degrees of tension and we observe constant, although slight, changes in the plant population. The influence of man is now more important than the rest of the biological influences. Through his interposition a large portion of the prairie and bottomland has been put under cultivation. In 1890 the basin contained 327,852 human beings, or an average of 20.5 to the square mile. The activity of the human population, by importing new plants and establishing them, by decimating the number of originally established individuals in some of the species, by permitting a group of 130, or more, alien plants to escape during the last forty years and establish themselves in varying degrees, has had a profound influence upon the plant-physiognomy of the valley. Among the biological factors of modern times the activity of man is conspicuous. Not only directly has he influenced the distribution, but indirectly through the importation of new animals, such as sheep, cattle, swine, fowls or horses, that, in turn, by their activities, have modified the aspect of the plant-population. He has exterminated many of the wild animals, notably the bison, which had a peculiar influence upon the distribution of plants, different from that of the domestic animals. He has planted trees, felled them, burned the underbrush, torn up the prairie with the plow and in a hundred ways altered the adjustments between individuals, species and formations of plants in the valley of the Minnesota.

Summary. The distribution of plants in a natural region presents many problems. These are found to be complex and demand for their solution a wide range of collateral information. Plants are found everywhere maintaining dynamic relations with each other. These relations have much to do with the facts of their distribution. Differences exist between the

different portions of the earth's land-surface in point of vegetation. These differences resolve themselves into distance, humidity and history differences. It happens then that the earth can be divided into floral regions. The northern hemisphere is more composite than the southern and its several regions are more affected by each other than are those of the southern. The Minnesota valley is found to bear closer relationship with certain portions of the earth than with others. The geological history of the country is needed for the explanation of all these phenomena. There is a general tension between plants centrally and distally located on the earth's land surface. More special tensions, between areas less and less, arise from this general tension and contribute to the general tension. The tension-lines are not constant, but variable under a complicated series of modifying laws. By means of these tensions, habitat, physiology, evolution, have been altered in their character. The origin of metaspermic plants was probably in the Jurassic. During Mesozoic time they had a very slight foot-hold on the periphery of stronger formations. In Tertiary time they underwent various migrations and became more strongly established. After Tertiary time the movements of glaciers had a profound influence upon the evolution and distribution of plants. The results of this glacial period are to be discovered in the conditions of the present. To-day, under various forces, the modification of the flora still continues.

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STATISTICS OF METASPERMIC PLANTS OF THE MINNESOTA VALLEY.

Value of statistics. In the following pages such numerical data as have seemed most necessary for an understanding of the distributional characters and physiognomic features of the Minnesota valley Metaspermae have been compiled. It is proper first of all to call attention to what has well been stated by De Candolle—that somewhat too great an air of mathematical exactness is conveyed even to professional botanists, by statistics of such a nature. The apparent rigidity of the calculations inspires a mistaken notion of rigidity in the distribution. On the contrary, however, the statistics are not truly indicative of such mathematical exactness of distribution as their appearance would imply; they are to a certain extent of the nature of averages or estimates. There are in their compilation, too, certain sources of error; for example, in the table which gives the north, south, east and west preponderance of species in the North American continent, the entry of any species is a matter of judgment from published geographical lists, and either the data of the lists may be incomplete or erroneous, or the judgment may be faulty. In order to correct such error it has been my effort to compile the statistics from several points of view. Under such method it is presumed that they will mutually correct each other and the general results will thus come to be of definite reliability.

Again, there is the danger that the personal equation of error, indicated in mistakes of counting or calculation, will permit a degree of vitiation that were better avoided. Although each group of statistics has been carefully compiled and the results checked in such a way as to guard the general results to what extent may be possible, it will readily be seen that a single small error would propagate itself unlimitedly, if by accident it should creep into the preliminary count.

In the third place, it must be noted that the possible oversights and errors in collection of plants and their subsequent determination, or errors in compilation of herbarium data, or overlooked errors in printing, or the failure to set down each group of data properly in preparing the manuscript, might all influence the statistical results which are about to be presented. Together with all these errors comes the chance of mistake in printing the statistics themselves, by omissions or by alterations, in going through the press. It is apparent, therefore, that the air of mathematical exactness presented by the figures of a tabulation is, to some extent, deceptive.

On the other hand, these chances of error thus stated in detail must not be overestimated. In spite of them all it is quite probable that every statistical entry will be sufficiently exact to serve as the basis of a generalisation concerning the distribution of Metaspermae in the valley of the Minnesota. Errors tend mutually to correct each other, and under the law of averages the results of a series of calculations vary little one way or the other. If it be discovered, for example, that of all the species indigenous to the region studied, 55.6 per cent. are of distinctively northern range, in North America, while 76.1 per cent. are distinctively southern in their range there is absolutely no question that the Minnesota valley Metaspermae are distinctively southern rather than northern in their distributional characters.

Thus it happens that the preparation of statistical tables is of real value in so far as they serve to group together facts that may be used for generalisation. The percentages themselves may be somewhat inexact, but the ratios between different percentages and the general comparative result will hardly be affected by the minor errors.

Point of view of statistical compilations. The compiler has brought together such statistics regarding families, genera and species as have seemed to him fitted best to indicate the distributional and physiognomic characters of the metaspermic population of the Minnesota valley. Unfortunately there are not lists of plants of other drainage-basins in North America with which comparisons would be instructive. Such comparative statistics are therefore omitted and an effort has been made rather to determine characters by an analytic process than synthetically to bring together results of comparison between the Minnesota valley and other districts. The inadequacy, from a scientific point of view, of comparing the Min-

nesota valley population with that of such a commonwealth as Nebraska, of which careful floras have been compiled, has already been intimated in the introductory chapter of this work. A political district can not have any distinct meaning in a plant-distributional inquiry. So, too, a comparison between the species of the Minnesota valley and those of the Atlantic United States, as compiled in Watson and Coulter's edition of the *Gray's Manual*, or between the valley species and those of the southern states, as compiled in Chapman's *Flora of the Southern States*, would be of doubtful value and nothing of the sort has been attempted. The idea has been, as stated, to analyse the plant-population with a view of discovering the preponderance-ratios of various distributional and physiognomic elements.

Points of statistical investigation. In a relatively circumscribed area, specific forms—and with these I have always included varietal forms as of the same implication—are more valuable than generic, and generic characters more important than family or ordinal characters. Being more limited and more definite, they are at the same time more easily handled, with approximate exactness and more instructive than characters of a greater generality. The principal compilations for the North American continent comparisons are of specific ranges and characteristics. But in determining the relationship of the Minnesota valley Metaspermæ to the Metaspermæ of the whole northern hemisphere, and of the world, the generic or family characters come into play as the more convenient and more exact for purposes of comparison. The general position of the Minnesota valley in the plant-population regions of the earth is first examined from the statistics of families. Next, the position of the Minnesota valley as an area of the northern hemisphere is determined, principally from the statistics of genera, although to some extent, also, from species. Last, the position of the Minnesota valley in the North American continent is determined principally from the statistics of species, although to some extent also, from genera. For the larger regions the larger categories are used as indications of comparative population. So far as concerns the determination of physiognomic characters only specific forms have been tabulated, for it is to species and not to genera that the plant-physiognomy of any region is to be referred

I. EXAMINATION OF FAMILIES REPRESENTED IN THE MINNESOTA VALLEY.

The total number of families represented by the metaspermic plant-population of the Minnesota valley is 106. According to Engler and Prantl, the total number of metaspermic families in the world is 222. Thus 48.0 per cent. of all the families in the world are represented within the region of our study. Of the 106 families, 21 are Monocotyledones, 60 are Archichlamydeæ, and 25 are Metachlamydeæ. The total number of monocotyledonous families is 43, of Archichlamydeæ, 131, and of Metachlamydeæ, 48. Thus there are in the Minnesota valley, 48.8 per cent. of all monocotyledonous families, 45.7 per cent. of all archichlamydeous and 52.0 per cent. of all metachlamydeous families. Of all families in the valley, 19.8 per cent. are Monocotyledones, 56.6 per cent. are Archichlamydeæ and 23.5 per cent. are Metachlamydeæ. These facts are condensed into the following table:

| 1. Statistics of Families. | | | |
|----------------------------|----------------|-----------------------------|---------------------------|
| | No. in valley. | Per cent. of all in valley. | Valley per cent. of each. |
| Monocotyledones..... | 21 | 19.8 | 48.8 |
| Archichlamydeæ | 60 | 56.6 | 45.7 |
| Metachlamydeæ..... | 25 | 23.5 | 52.0 |
| Total in valley..... | 106 | 100.0 | 48.0 |

Not all of these families are equally distributed over the world. Some are much more limited in their range than others. An examination of the general range of the 106 families represented in the valley of the Minnesota shows that they may be divided, according to their range into, six groups as follows:

- A. Cosmopolitan families.
- B. Extratropical families.
- C. Tropical and subtropical families.
- D. Northern extratropical families.
- E. Western Hemisphere families.
- F. North American families.

It will be necessary to observe one or two points in this division. In the first place it must be recognised that not all of the families in any of these groups are of equivalent distribution. In Group A, for example, have been included such families as are represented in both tropical and extratropical regions of both eastern and western hemispheres. A family of which the range answered to such a description might nevertheless be very much more limited in its distribution than one which might be found in almost every continent or island—as, for illustration, the *Juncaceæ*. The groups are therefore intended to be and are somewhat elastic. Again, it is sometimes thought advisable to include the same family in two, or even three groups, in order to give the proper notion of its range. For example, the *Sarraceniaceæ* includes three genera, *Sarracenia*, *Chrysamphora* and *Heliamphora*. The first two are limited to North America, one being Atlantic, the other Pacific. The third is found in British Guiana. Under these conditions of North American preponderance it seems proper to enter the *Sarraceniaceæ* as North American. But since a genus is developed in South America it seems proper, too, to enrol the family among the Western Hemisphere forms. Third, it will be noticed that Cosmopolitan families belong also to the next five divisions; Extratropical families include also the Northern extratropical. North American families are included in the Western Hemisphere group. Evidently, then, the general intent of the classification into groups is to give not total range, but *distinctive* range. We see, then, how the *Juglandaceæ* may be classed as Northern Extratropical, while the *Saxifragaceæ*, being represented also in the southern hemisphere, are more properly placed under the wide group of Extratropical families.

The following table will indicate the distinctive range of Minnesota valley families:

A. Table Illustrating the Distinctive Range of

| COSMOPOLITAN. | EXTRATROPICAL. | TROPICAL AND SUBTROPICAL. |
|-----------------------|--------------------|------------------------------|
| Typhaceae..... | | |
| Potamogetonaceae..... | Sparganiaceae..... | |
| Najadaceae..... | | |
| | Juncagineae..... | |
| Alismaceae..... | | |
| Hydrocharitaceae..... | | |
| Gramineae..... | | |
| Cyperaceae..... | | |
| Lemnaceae..... | | Aroideae..... |
| | | Xyridaceae..... |
| | | Eriocaulaceae..... |
| | | Commelinaceae..... |
| Pontederiaceae..... | | |
| Juncaceae..... | | |
| Liliaceae..... | | |
| | | Amaryllidaceae..... |
| | Dioscoreaceae..... | |
| Iridaceae..... | | |
| Orchidaceae..... | | Orchidaceae..... |
| | | |
| Myricaceae..... | | |
| Salicaceae..... | | |
| | Betulaceae..... | |
| | | |
| | Urticaceae..... | |
| | | Moraceae..... |
| Santalaceae..... | | |
| Aristolochiaceae..... | | |
| Polygonaceae..... | | |
| Chenopodiaceae..... | | |
| Amarantaceae..... | | |
| | | Phytolaccaceae..... |
| | | Nyctaginaceae..... |
| Portulacaceae..... | | |
| Caryophyllaceae..... | | |
| Nymphaeaceae..... | | |
| Ceratophyllaceae..... | | |
| Ranunculaceae..... | | |
| | | |
| | Papaveraceae..... | Menispermaceae..... |
| | | Papaveraceae..... |
| Cruciferae..... | | |
| | | Capparidaceae..... |
| Droseraceae..... | | |
| | Crassulaceae..... | Crassulaceae..... |
| | Saxifragaceae..... | |
| Rosaceae..... | | |
| Leguminosae..... | | |
| | Geraniaceae..... | |
| | Oxalidaceae..... | Oxalidaceae..... |
| Linaceae..... | | |
| | Rutaceae..... | |
| Polygalaceae..... | | |
| Euphorbiaceae..... | | |

[illegible]

From the facts of distribution compiled above it is possible to present the following numerical statistics.

| 2. Statistics of Families.—Numerical. | | | | | | | | |
|---------------------------------------|---------------|----------------|-------------------|--------------------|-------------------------------|--------------------|-----------------------|------------------|
| | No. in world. | No. in valley. | No. Cosmopolitan. | No. Extratropical. | No. tropical and subtropical. | No. W. Hemisphere. | No. N. extratropical. | No. N. American. |
| Monocotyledones..... | 43 | 21 | 13 | 3 | 6 | 2 | 0 | 0 |
| Archichlamydeæ..... | 131 | 60 | 29 | 14 | 13 | 5 | 13 | 1 |
| Metachlamydeæ..... | 48 | 25 | 13 | 1 | 9 | 2 | 4 | 1 |
| Totals..... | 222 | 106 | 55 | 18 | 28 | 9 | 17 | 2 |

The significance of the above figures will not be fully apprehended unless the various percentages are kept in mind. To put these before the eye in a separate table will perhaps be useful. In the following tabulation the relation of the various range-elements to the taxonomic groups and the analysis of each taxonomic group according to range are presented. Such a table indicates more exactly than the one previously constructed just what influence may be credited to the different taxonomic groups in the general distribution of the families.

| 3. Statistics of Families.—Percentages. | | | | | | | | | | | | |
|---|-------------------------------------|---------------------------------|-------------------------------------|-----------------------------|--------------------------------|---------------------------|----------------------------|-------------------------------|---------------------------------------|----------------------------------|----------------------------------|--------------------------------|
| | Per cent. of all cosmop. in valley. | Per cent. of all extratropical. | Per cent. of trop. and subtropical. | Per cent. of W. Hemisphere. | Per cent. of N. extratropical. | Per cent. of N. American. | Cosmop. per cent. of each. | Extratrop. per cent. of each. | Trop. and subtrop. per cent. of each. | W. Hemisphere per cent. of each. | N. Extratrop. per cent. of each. | N. American per cent. of each. |
| Monocotyledones..... | 23.6 | 16.6 | 21.4 | 22.2 | 0.0 | 0.0 | 61.9 | 14.2 | 23.5 | 9.5 | 0.0 | 0.0 |
| Archichlamydeæ..... | 52.7 | 77.7 | 46.4 | 55.5 | 76.4 | 50.0 | 48.3 | 23.3 | 21.6 | 8.3 | 21.6 | 1.8 |
| Metachlamydeæ..... | 23.6 | 5.5 | 32.1 | 22.2 | 23.5 | 50.0 | 52.0 | 4.0 | 36.0 | 8.0 | 16.0 | 4.0 |

Examination of the two tabulations preceding will serve to indicate the principal characters, by families, of the metaspermic population of the Minnesota valley. Of the 106 families, 55 are of cosmopolitan range, 90 are extratropical, 83 tropical. Of the 90 extratropical families, 55 are also in the tropics, while of the 83 tropical, 55 are also in the extratrop-

ical regions. Of the 90 extratropical, 18 are extratropical in both northern and southern hemispheres, while 17 are extratropical only in the northern hemisphere. The character of the families represented in the valley may then be summed up as generally extratropical, modified by tropical. The families indicate that the Minnesota valley is first of all an extratropical region. For their number, the Metachlamydeae contribute the most of the distinctively tropical modification, and the Archichlamydeae the least. For their number, the Monocotyledones contribute the most of the distinctively cosmopolitan element and the least of the endemic. For their number the Archichlamydeae contribute the most of the distinctively extratropical modification. These facts are in unison with the notion that the Metachlamydeae, as a group, are the most recent, and the Monocotyledones, as a group, the most ancient. The Monocotyledones having had a longer time of development have become more widely scattered and their families are therefore more generally cosmopolitan. Of the total monocotyledonous families in the valley 61.9 per cent. are of cosmopolitan range, while only 48.3 per cent. of the archichlamydeous families are of such range. Thus in the distribution of its families we find the Minnesota valley adds to the evidence already derived from other sources—that the Metachlamydeae are comparatively recent and the Monocotyledones comparatively early in their respective emergences.

The archichlamydeous families are *par excellence* the extratropical families. Of all distinctively extratropical families represented in the valley they form the large percentage of 77.7—the largest percentage in the table. And of the northern extratropical they form 76.4 per cent. For their number, too, they are equally conspicuous as distinctively extratropical. In the three great taxonomic divisions, then, we find three marked distributional characters peculiar to the families. The older group of the Monocotyledones is distinguished for the cosmopolitan range of its families; the younger group of the Archichlamydeae is distinguished for the extratropical range of its families, while the youngest group, the Metachlamydeae, is characterised by its tropical and subtropical range. The metachlamydeous plants, then, of the Minnesota valley belong to families, in general more centrally than distally located on the surface of the earth; the archichlamydeous plants belong to families, in general more distally than centrally located, and the monocotyledonous plants belong to families, in general

widely dispersed over both distal and central regions. Monocotyledones and Metachlamydeae, therefore, characterise the central family-element of the Minnesota valley, and Monocotyledones and Archichlamydeae the distal family-element of the valley. This seems to be the most useful generalisation that can be made from the statistics of families.

II. EXAMINATION OF GENERA REPRESENTED IN THE

MINNESOTA VALLEY.

The total number of genera represented in the valley of the Minnesota is 407. Of these 105 or 25.8 per cent. are monocotyledonous; 174 or 42.7 per cent. are archichlamydeous; and 128 or 31.2 per cent. are metachlamydeous. The following table presents these points in a condensed form.

| 4. Representation of Genera. | | | |
|-------------------------------|-------------|----------------------------|------------------------------------|
| | No. of gen. | Perct. of all gen. in val. | Average no. of gen. per family. |
| Monocotyledones | 105 | 25.8 | 5.00 |
| Archichlamydeae | 174 | 42.7 | 2.90 |
| Metachlamydeae | 128 | 31.2 | 5.12 |
| Total no. of genera | 407 | | Gen. average no. per family, 3.84. |

B. Table Illustrating the Distinctive Range of

| COSMOPOLITAN. | EXTRATROPICAL. | TROPICAL AND SUBTROPICAL. |
|-----------------------|----------------------|---------------------------|
| Typha | | |
| Potamogeton | | |
| Zanichellia | | |
| Najas | Triglochin | |
| Alisma | | |
| Sagittaria | | |
| | | Vallisneria |
| Andropogon | | |
| Panicum | | Cenchrus |
| | | Homalocenchrus |
| | Phalaris | |
| Hierochloë | | Aristida |
| Stipa | | |

It is possible also to pursue a line of investigation in regard to these 407 genera precisely similar to that which was followed out for the 106 families that are represented in the valley of the Minnesota. As before, in order to analyse the general ranges, we may group the genera under the same six divisions that were established for the families, namely:

- A. Cosmopolitan genera.
- B. Extratropical genera.
- C. Tropical and subtropical genera.
- D. Northern extratropical genera.
- E. Western Hemisphere genera.
- F. North American genera.

The grouping of the genera under these heads is with the same reservations as in the case of the families. As before, it may be necessary to enter the same genus under more than one head. The number of species developed in any genus is considered to furnish the best index of its relative preponderance in one locality rather than another. Where, then, the species are particularly numerous in extratropical regions and fewer in tropical regions, the genus is in general set down as extratropical, and similarly in the other cases. To indicate the distinctive range of the genera represented in the Minnesota valley is the purpose of the following table:

Genera Represented in the Minnesota Valley.

| NORTHERN EXTRATROPICAL. | WESTERN HEMISPHERE. | NORTH AMERICA. |
|----------------------------|---------------------|----------------|
| Sparganium..... | | |
| | | |
| | | |
| | | |
| Scheuchzeria..... | | |
| | | |
| | Elodea..... | |
| | | |
| | | |
| | Zizania..... | |
| Homalocenchrus..... | | |
| | | |
| | | |
| | | |

B. Table Illustrating the Distinctive Range of

| COSMOPOLITAN. | EXTRATROPICAL. | TROPICAL AND SUBTROPICAL. |
|-------------------|-------------------|------------------------------|
| | Oryzopsis..... | |
| | Muhlenbergia..... | |
| | | |
| | | |
| Agrostis..... | Agrostis..... | |
| | Deyeuxia..... | |
| Deschampsia..... | | |
| | Avena..... | |
| Danthonia..... | | |
| Spartina..... | | |
| | | |
| | | |
| Phragmites..... | | |
| Eragrostis..... | | Eragrostis..... |
| | Koeleria..... | |
| Poa..... | | |
| | | |
| Festuca..... | Festuca..... | |
| Bromus..... | Bromus..... | |
| | Agropyrum..... | |
| | Hordeum..... | |
| | Elymus..... | |
| | Hystrix..... | |
| Hemicarpha..... | | |
| | | |
| Cyperus..... | | |
| Scirpus..... | | |
| | | Heleocharis..... |
| Iria..... | | |
| Mariscus..... | | |
| | | Rhynchospora..... |
| | Carex..... | Scleria..... |
| | | |
| | | |
| | | |
| Lemna..... | | |
| Grantia..... | | |
| | | Xyris..... |
| Eriocaulon..... | | |
| | | |
| Heteranthera..... | | |
| Juncus..... | | |
| Cyperella..... | | |
| | | |
| | | |
| | | |

Genera Represented in the Minnesota Valley.—Continued.

| NORTHERN EXTRATROPICAL. | WESTERN HEMISPHERE. | NORTH AMERICA. |
|----------------------------|---------------------|--------------------|
| | Muhlenbergia | |
| | | Brachyelytrum..... |
| Alopecurus | Sporobolus..... | |
| Cinna..... | | |
| | | |
| Ammophila | | |
| | | |
| | | |
| | | Schedonnardus..... |
| Beckmannia | Bouteloua | |
| | | Bulbilis..... |
| | | |
| | | Eatonia..... |
| Scolochloa..... | | |
| Panicularia..... | | |
| | | |
| | | |
| | | |
| | | Dulichium..... |
| Eriophorum..... | | |
| | | |
| Heleocharis | | |
| | | |
| | | |
| Acorus | | |
| Spathyema..... | | |
| Calla..... | | |
| Arisaema | | |
| | | |
| | Xyris | |
| | | |
| | Tradescantia | |
| | Pontederia | |
| | | |
| Tofieldia | | |
| | | Zigadenus..... |
| Veratrum | | Melanthium |
| | | |

Genera Represented in the Minnesota Valley.—Continued.

| NORTHERN EXTRATROPICAL. | WESTERN HEMISPHERE | NORTH AMERICA. |
|----------------------------|--------------------|-------------------|
| | | Uvularia..... |
| Allium | | |
| Lilium | | Erythronium |
| | | Camassia |
| Clintonia | | |
| Unifolium | | |
| Polygonatum..... | | Medeola |
| | | Trillium |
| | | |
| | | |
| Iris..... | | |
| | Sisyrinchium | |
| Orchis..... | | |
| | | |
| Arethusa | | |
| | | |
| Peramium..... | | |
| Achroanthes | | |
| | | |
| Corallorhiza | | |
| | | Cathea |
| | | Aplectrum |
| Juglans..... | | |
| | | Scoria..... |
| Populus | | |
| | | |
| | | |
| Carpinus | | |
| Ostrya | | |
| Corylus | | |
| Betula..... | | |
| | | |
| | | |
| Ulmus..... | | |
| Morus..... | | |
| Humulus | | |
| | | |
| | | |
| | Adicea | |
| | | |
| | | |
| Comandra | | |
| Asarum | | |
| Rumex..... | | |
| | | |
| Corispermum | | |
| | | |
| | | |
| | Froelichia | Acnide..... |
| | | |

Genera Represented in the Minnesota Valley.—Continued.

| NORTHERN EXTRATROPICAL. | WESTERN HEMISPHERE | NORTH AMERICA. |
|----------------------------|--------------------|-------------------|
| | Mirabilis | |
| | Talinum | |
| Claytonia | | |
| | | |
| | | |
| Cerastium | | |
| Moehringia | | Anychia |
| | | |
| | | |
| Nymphaea | | |
| Hydrastis | | |
| | | |
| Isopyrum | | |
| Actaea | | |
| Aquilegia | | |
| Delphinium | | |
| | | |
| Oxygraphis | | |
| | | |
| Podophyllum | | |
| Leontice | | |
| Menispermum | | |
| | | Sanguinaria |
| Capnorchis | | |
| Neckeria | | Thelypodium |
| | | |
| Barbarea | | |
| | | |
| | | |
| | | Lesquerella |
| | | |
| Arabis | | |
| Erysimum | | |
| | | |
| | | Sarracenia |
| | | |
| Penthorum | | |
| Saxifraga | | |
| Tiarella | | |
| | | Heuchera |
| Mitella | Mitella | |
| Chrysosplenium | | |
| Parnassia | | |
| Opulaster | | |
| Spiraea | | |
| Pirus | | |
| Amelanchier | | |
| Crataegus | | |

B. Table Illustrating the Distinctive Range of

| COSMOPOLITAN. | EXTRATROPICAL. | TROPICAL AND SUBTROPICAL. |
|-------------------|-----------------|------------------------------|
| Rubus | Fragaria | |
| | | |
| | | Rosa |
| | Agrimonia | |
| | | Cerasus..... |
| | | |
| | | Acuania |
| Cassia..... | | |
| | | |
| Lupinus | | |
| Lotus..... | | |
| Psoralea..... | | |
| | | Dalea |
| | | |
| | | Cracca..... |
| | | Astragalus..... |
| | | |
| Glycyrrhiza..... | | |
| Pleurolobus | | |
| Lespedeza..... | Vicia..... | |
| | Lathyrus | |
| | | |
| Phaseolus..... | | |
| | | |
| | Geranium | |
| Oxalis | | |
| Linum..... | | Zanthoxylum..... |
| | | |
| Polygala | | |
| | | Ricinocarpus..... |
| Euphorbia | | Euphorbia |
| | Stellaria..... | |
| | Rhus..... | |
| | | Evonymus |
| Celastrus | | |
| Ilex..... | | |
| | | Acer..... |
| | Impatiens | |
| | | |
| | | |
| | Vitis..... | |
| | | |
| | Malva..... | |
| | | |
| | | Hibiscus..... |
| | | |
| Hypericum | | |
| | Viola | |
| | | |

Genera Represented in the Minnesota Valley.—*Continued.*

| NORTHERN EXTRATROPICAL. | WESTERN HEMISPHERE | NORTH AMERICA. |
|----------------------------|--------------------|-----------------|
| Fragaria..... | | |
| Potentilla..... | | |
| Geum..... | | |
| Rosa..... | | |
| Cerasus..... | | |
| Prunus..... | | |
| | Acuania..... | |
| Gymnocladus..... | | |
| | | |
| Dalea..... | | Kuhnistera..... |
| | | |
| Astragalus..... | | Amorpha..... |
| Spiesia..... | | |
| | | |
| | | |
| Apios..... | | |
| Falcata..... | | Baptisia..... |
| | | |
| | | |
| | | Ptelea..... |
| | | |
| | | |
| Evonymus..... | | |
| | | |
| Staphylea..... | | |
| Acer..... | | |
| | | Ceanothus..... |
| Rhamnus..... | | |
| Parthenocissus..... | | |
| Tilia..... | | |
| | | Napaea..... |
| Helianthemum..... | | Hudsonia..... |
| | | |
| Opuntia..... | | Opuntia..... |

Genera Represented in the Minnesota Valley.—Continued.

| NORTHERN EXTRATROPICAL. | WESTERN HEMISPHERE | NORTH AMERICA. |
|----------------------------|--------------------|---------------------|
| | | Dirca..... |
| | | Leptargyraia..... |
| | | |
| | | |
| | | Gaura..... |
| | | |
| Circaea..... | Oenothera..... | |
| | | |
| | | |
| Aralia..... | | |
| | | |
| | | Polytaenia..... |
| Heracleum..... | | |
| | | Tiedemannia..... |
| | | Thaspium..... |
| | | Zizia..... |
| Cicuta..... | | |
| Deeringia..... | | |
| | | |
| Pseva..... | | |
| Pirola..... | | |
| Monotropa..... | | |
| Ledum..... | | |
| Andromeda..... | | |
| Lyonia..... | | |
| Chiogenes..... | | |
| Oxycoccus..... | | Arctostaphylos..... |
| | | |
| Aretia..... | | |
| Lysimachia..... | Steironema..... | |
| Trientalis..... | | |
| | | |
| Menyanthes..... | | |
| | | |
| Apocynum..... | | |
| | | |
| | | |
| | | Phlox..... |
| | Collomia..... | |
| | | |
| | | Macrocalyx..... |
| | | Hydrophyllum..... |
| | Phacelia..... | |
| Lithospermum..... | | Onosmodium..... |

Genera Represented in the Minnesota Valley.--Continued.

| NORTHERN EXTRATROPICAL. | WESTERN HEMISPHERE | NORTH AMERICA. |
|----------------------------|--------------------|---------------------|
| | | |
| | | |
| Leptostachya..... | | |
| Verbena..... | Verbena..... | |
| | | Isanthus..... |
| | | |
| Lycopus..... | | Koellia..... |
| | | |
| Acinos..... | Hedeoma..... | |
| | | Monarda..... |
| Vleckia..... | | |
| Dracocephalum..... | | Physostegia..... |
| | | |
| | | |
| | | |
| Scrophularia..... | | |
| | | Chelone..... |
| | | Penstemon..... |
| | | |
| | | |
| | | Synthyris..... |
| | Gerardia..... | |
| Castilleja..... | | |
| Pedicularis..... | | |
| Melampyrum..... | | |
| | | |
| | | Aphyllon..... |
| | | |
| | | Houstonia..... |
| | | |
| Linnaea..... | | Symphoricarpos..... |
| | | |
| Diervilla..... | | |
| Triosteum..... | | |
| | | |
| Adoxa..... | | |
| | | |
| Valerianella..... | | |
| | | |
| | Micrampelis..... | |
| Campanula..... | | |
| Pentagonia..... | | |
| | | |
| | | |
| | | Kuhnia..... |
| | | Laciniaria..... |

B. Table Illustrating the Distinctive Range of

| COSMOPOLITAN. | EXTRATROPICAL. | TROPICAL AND SUBTROPICAL. |
|-----------------|------------------|------------------------------|
| | | |
| | | |
| | | |
| | | Boltonia |
| Aster..... | | |
| Erigeron..... | Antennaria..... | |
| | | Anaphalis |
| Gnaphalium..... | Adenocaulon..... | |
| | | |
| | | |
| | | |
| | | Ambrosia..... |
| Xanthium..... | | |
| | | |
| Coreopsis | | |
| Bidens..... | | |
| | | |
| | | |
| | Erechthites..... | |
| Artémisia | | |
| Senecio | Cnicus | |
| | Lactuca..... | |
| | | Taraxacum |
| | | |
| | | |
| | | |
| | | Crepis..... |
| | | |

The facts of distribution compiled in the foregoing tabulation will be better apprehended if presented separately, by groups, and such separation and grouping of the statistics is indicated in the following six tables. I have named the group of genera for which a distinctive range has been determined a “*generic element*.” The six generic elements of the preceding tabulation are now considered in succession. The numerical statistics and the two groups of percentage statistics are displayed side by side. The tables, then, show the number which each taxonomic group furnishes to the generic element, the percentage that this number is of the whole generic element and the percentage of the taxonomic group that may be considered as belonging to each generic element. These generic elements may

Genera Represented in the Minnesota Valley.—Continued.

| NORTHERN EXTRATROPICAL. | WESTERN HEMISPHERE | NORTH AMERICA. |
|----------------------------|--------------------|-------------------|
| | Grindelia..... | Diplegon..... |
| | | Solidago..... |
| | Haplopappus | |
| Boltonia | | |
| | | |
| | | |
| Anaphalis | | |
| | | |
| | Polymnia..... | |
| | Parthenium | Silphium |
| | | Parthenium |
| | | Cyclachaena |
| Ambrosia..... | | |
| | | |
| | Heliopsis | |
| | | Rudbeckia..... |
| | Helianthus..... | |
| | | |
| | | Helenium |
| | Gaillardia..... | |
| | Dyssodia..... | |
| Achillea..... | | |
| | | |
| | | |
| | | |
| Taraxacum | | |
| | | Nothocalais..... |
| | Agoseris | |
| | | Adopogon |
| | | Lygodesmia |
| Prenanthes..... | | |
| Crepis..... | | |
| Hieracium..... | | |

be examined in the same order that was adopted in the general tabulation.

| 5. The Cosmopolitan Generic Element. | | | |
|--------------------------------------|-------------------|-----------------------------------|------------------------------------|
| | No. of genera. | Per cent. of all Cosmopolitan. | Cosmopolitan per cent. of each. |
| Monocotyledones..... | 34 | 31.7 | 32.3 |
| Archichlamydeae..... | 42 | 39.2 | 24.0 |
| Metachlamydeae..... | 31 | 29.1 | 24.2 |
| Total Cosmopolitan..... | 107 | | |
| Cosmop. per cent of all genera | 26.4 | | |

From the table above it appears that the cosmopolitan genera of the Monocotyledones, form a larger percentage of the total Monocotyledones than do the cosmopolitan genera of the other two taxonomic groups. Passing to the extratropical genera, we find results similarly in line with those determined from the families.

| 6. The Extratropical Generic Element. | | | |
|---------------------------------------|----------------|---------------------------------|----------------------------------|
| | No. of genera. | Per cent. of all Extratropical. | Extratropical per cent. of each. |
| Monocotyledones | 16 | 26.0 | 15.2 |
| Archichlamydeae..... | 30 | 49.1 | 17.1 |
| Metachlamydeae | 15 | 24.5 | 11.7 |
| Total Extratropical. | 61 | | |
| Extratrop. per ct. of all genera | 15.1 | | |

Here it is to be noted that the extratropical percentage of the Archichlamydeae exceeds the same percentage in the other taxonomic groups. Continuing with the tropical and subtropical element, the next table may be examined:

| 7. The Tropical and Subtropical Generic Element. | | | |
|--|----------------|--|---|
| | No. of genera. | Per cent. of all Tropical and Subtropical. | Tropical and Subtropical per cent. of each. |
| Monocotyledones..... | 16 | 32.0 | 15.2 |
| Archichlamydeae. | 25 | 50.0 | 14.8 |
| Metachlamydeae..... | 9 | 18.0 | 7.0 |
| Total Tropical and Subtrop | 50 | | |
| Tropical and Subtropical per cent. of all genera. | 12.4 | | |

An interesting variation from the results of family-examination is apparent in the table above. In the central realm element the monocotyledonous influence is more distinct by genera than is the metachlamydeous. By families, it will be

recollected, the reverse was the case. In the northern extratropical generic element the parallelism is resumed as appears in the next table.

8. Northern Extratropical Generic Element.

| | | Per cent. of all Northern Extratropical. | Northern Extratropical per cent. of each. |
|--|------|--|---|
| Monocotyledones..... | 28 | 20.9 | 26.6 |
| Archichlamydeae..... | 67 | 50.0 | 38.2 |
| Metachlamydeae | 39 | 29.1 | 30.4 |
| Total North'n Extratropical | 134 | | |
| Northern Extratropical per cent. of all genera. | 33.1 | | |

In the above the Archichlamydeæ appear once more as distinctly extratropical, both numerically and by percentage.

The next tables indicate in a most convincing manner the juniority of the Metachlamydeæ. Both of these tables are in line with the tabulations of families which precede and those of species which are to follow.

9. Western Hemisphere Generic Element.

| | | Per cent. of all Western Hemisphere. | Western Hemisphere per cent. of each. |
|---|-----|--------------------------------------|---------------------------------------|
| Monocotyledones..... | 9 | 28.1 | 8.5 |
| Archichlamydeae..... | 7 | 21.9 | 4.0 |
| Metachlamydeae | 16 | 50.0 | 12.5 |
| Total Western Hemisphere | 32 | | |
| Western Hemisphere per ct. of all genera..... | 7.9 | | |

From the above the weak position of the Archichlamydeæ and the strong position of the Metachlamydeæ as furnishing sub-endemic genera is very apparent. Of the total group of

metachlamydeous genera 12.5 per cent. are limited in their range to the western hemisphere. This percentage does not include, however, the results of the succeeding table, for in every case distinctive not total range, is given. This was explained above for the families. The last table of the series follows:

| 10. North American Generic Element. | | | |
|---|------|-------------------------------------|--------------------------------------|
| | | Per cent. of all North American. | North American per cent. of each. |
| Monocotyledones... .. | 14 | 21.9 | 13.3 |
| Archichlamydeae... .. | 23 | 35.9 | 13.1 |
| Metachlamydeae..... | 27 | 43.2 | 13.2 |
| Total North American | 64 | | |
| North American per cent. of all genera.... | 15.8 | | |

The figures of the last table indicate two facts concerning distribution, both of which are important. By the slight variation in the last column from the mean of 13.2 per cent. it will be seen that, so far as the valley of the Minnesota and its Metaspermae can be placed in evidence, there is about an equal tendency in each of the three taxonomic groups to develop endemic genera. The last column of figures serves to strengthen our belief that the Metachlamydeae are the youngest of the three groups, for while the opportunity for developing endemic genera is no better in this group than in the other two, we find upon examining the figures of the second column that the Metachlamydeae include by far the larger per cent. of the endemic genera. The apparent explanation of this fact by the different length of time that has sufficed for distribution in and out of the continent, in the case of the three groups of unequal age, is even more clearly developed by the evident inadmissibility of attributing this difference of range to any inherent quality of the groups in question.

An examination of the genera may also be conducted to determine the North American development of each. In the next table the genera are classified as northern, southern, eastern and western. Some explanation of this grouping may be

necessary. Preponderance of species in one of the regions over the opposite region is taken as the index of range. The 95th meridian W. of Greenwich is adopted as the line dividing the eastern from the western half of the continent, and the 45th parallel of N. latitude as the line dividing the northern from the southern region. If then in a given genus a greater number of species occur north and east of the dividing lines than south and west, such a genus is entered as northern and eastern, in the table. No attempt at hairsplitting distinctions has been made, and genera developed pretty evenly in all parts of the continent are entered in each of the four groups. Very commonly a genus will be entered in three groups. The groups of three which are most common are the north-east-west, the south-east-west and north-south-east groups. It is believed that by such a comparatively elastic method of entry more accurate results will be obtained than if one were to attempt for each genus to strike such a demarcation line that it could fall into but two groups. Again, in the case of genera either monotypic or with very few species, the numerical test must be abandoned. In its place is adopted the specific range and the comparative frequency of individuals on different sides of the demarcation lines. From these considerations it will be seen that the north-south-east-west group of genera is of the most generally distributed genera while the south-east or north-east group and others of similar construction are the least generally developed in the North American continent. Large development of range may however, and often does, exist together with small development of species, or *vice versa*. With so much of emphasis upon the elasticity of grouping the table may be presented.

C. Table Illustrating Continental Development of Genera Represented in the Minnesota Valley.

| NORTHERN. | SOUTHERN. | EASTERN. | WESTERN. |
|-------------------|--|-------------------|-------------------|
| Typha | Typha..... <i>Typha</i> <i>aceae.</i> | Typha..... | Typha..... |
| Sparganium..... | <i>Sparga</i> <i>niaceae.</i> | Sparganium..... | Sparganium..... |
| Potamogeton..... | <i>Potamog</i> <i>etonaceae.</i> | Potamogeton..... | |
| Zanichellia..... | Zanichellia..... | Zanichellia..... | Zanichellia..... |
| | <i>Naja</i> <i>daceae.</i> | | |
| | Najas..... | Najas..... | |
| Triglochin..... | <i>Juncu</i> <i>gtineae.</i> | Triglochin..... | Triglochin..... |
| Scheuchzeria..... | | Scheuchzeria..... | Scheuchzeria..... |
| Alisma..... | <i>Alism</i> <i>aceae.</i> | | Alisma..... |
| | Sagittaria..... | Sagittaria..... | |

C. Table Illustrating Continental Development of Genera Represented in the Minnesota Valley.—*Continued.*

| NORTHERN. | SOUTHERN. | EASTERN. | WESTERN. |
|--------------------|--|---------------------------------|--------------------|
| Elodea..... | <i>Hydrocharitaceae.</i> Vallisneria..... | Elodea..... Vallisneria..... | Elodea..... |
| | <i>Gramineae.</i> Andropogon..... | Andropogon..... | |
| | Panicum..... | Panicum..... | |
| | Cenchrus..... | Cenchrus..... | |
| | Zizania..... | Zizania..... | |
| | Homalocenchrus..... | Homalocenchrus..... | |
| | Phalaris..... | Phalaris..... | Phalaris..... |
| Hierochloë..... | Hierochloë..... | Hierochloë..... | Hierochloë..... |
| | Aristida..... | Aristida..... | |
| Stipa..... | | | Stipa..... |
| Oryzopsis..... | | | Oryzopsis..... |
| Brachyelytrum..... | Muhlenbergia..... | Muhlenbergia..... | |
| Alopecurus..... | Brachyelytrum..... | Brachyelytrum..... | Alopecurus..... |
| | Sporobolus..... | Sporobolus..... | |
| Agrostis..... | Cinna..... | | Cinna..... |
| Deyeuxia..... | | | Agrostis..... |
| | | | Deyeuxia..... |
| Deschampsia..... | Ammophila..... | Ammophila..... | Deschampsia..... |
| Avena..... | | Avena..... | |
| | Danthonia..... | Danthonia..... | |
| | Spartina..... | Spartina..... | |
| | Schedonnardus..... | | Schedonnardus..... |
| | Bouteloua..... | Bouteloua..... | |
| Beckmannia..... | Beckmannia..... | | Beckmannia..... |
| | Bulbils..... | Bulbils..... | |
| Phragmites..... | Phragmites..... | Phragmites..... | Phragmites..... |
| | Eragrostis..... | Eragrostis..... | |
| | Eatonia..... | Eatonia..... | |
| Koeleria..... | | Koeleria..... | Koeleria..... |
| Poa..... | | Poa..... | Poa..... |
| Scolochloa..... | | Scolochloa..... | |
| Panicularia..... | | Panicularia..... | |
| Festuca..... | | | Festuca..... |
| Bromus..... | | | Bromus..... |
| Agropyrum..... | | Agropyrum..... | |
| Hordeum..... | | | Hordeum..... |
| Elymus..... | | Elymus..... | |
| Hystrix..... | | Hystrix..... | |
| | <i>Cyperaceae.</i> Hemicarpha..... | Hemicarpha..... | |
| | Dulichium..... | Dulichium..... | |
| | Cyperus..... | Cyperus..... | |
| Eriophorum..... | | Eriophorum..... | |
| | Scirpus..... | Scirpus..... | |
| | Heleocharis..... | Heleocharis..... | |
| | Iria..... | Iria..... | |
| | Mariscus..... | Mariscus..... | Mariscus..... |
| | Rhynchospora..... | Rhynchospora..... | |
| | Scleria..... | Scleria..... | |
| Carex..... | Carex..... | Carex..... | |
| | <i>Aroidae.</i> Acorus..... | Acorus..... | |
| Acorus..... | | Spathyema..... | |
| Spathyema..... | | Calla..... | |
| Calla..... | Arisaema..... | Arisaema..... | |
| | <i>Lemnaceae.</i> Lemna..... | Lemna..... | |
| | Grantia..... | Grantia..... | Lemna..... |
| | <i>Xyridaceae.</i> Xyris..... | Xyris..... | |
| | <i>Eriocaulaceae.</i> Eriocaulon..... | Eriocaulon..... | |
| | <i>Commelinaceae.</i> Tradescantia..... | Tradescantia..... | |
| | <i>Pontederiaceae.</i> Pontederia..... | Pontederia..... | |
| | Heteranthera..... | Heteranthera..... | |
| | <i>Juncaceae.</i> Juncus..... | Juncus..... | |
| Juncus..... | | Cyperella..... | Juncus..... |
| Cyperella..... | | | Cyperella..... |

C. Table Illustrating Continental Development of Genera Represented in the Minnesota Valley.—Continued.

| NORTHERN. | SOUTHERN. | EASTERN. | WESTERN. |
|-------------------|-------------------------------|-----------------------------|-------------------|
| | <i>Lilia</i> <i>ceae.</i> | | |
| | Tofieldia..... | Tofieldia..... | |
| Melanthium..... | Zigadenus..... | Zigadenus..... | |
| | Veratrum..... | Melanthium..... | |
| Allium..... | Uvularia..... | Veratrum..... | |
| Erythronium..... | Lilium..... | Uvularia..... | Allium..... |
| Camassia..... | | | Lilium..... |
| Clintonia..... | | Camassia..... | Erythronium..... |
| Unifolium..... | | Clintonia..... | Camassia..... |
| | Polygonatum..... | Unifolium..... | Clintonia..... |
| | Medeola..... | Polygonatum..... | Unifolium..... |
| | Trillium..... | Medeola..... | |
| | Smilax..... | Trillium..... | |
| | <i>Amaryllidaceae.</i> | Smilax..... | |
| | Hypoxis..... | <i>Hypoxis</i> <i>ceae.</i> | |
| | <i>Dioscorea</i> <i>ceae.</i> | Dioscorea..... | |
| Iris..... | Iris..... | <i>Iridaceae.</i> | |
| | Sisyrinchium..... | Iris..... | Iris..... |
| Cypripedium..... | <i>Orchidaceae.</i> | | Sisyrinchium..... |
| Orchis..... | | Cypripedium..... | |
| Habenaria..... | | Orchis..... | |
| Arethusa..... | Pogonia..... | Habenaria..... | |
| | Gyrostachys..... | Pogonia..... | |
| Achroanthos..... | Peramium..... | Arethusa..... | |
| Leptorchis..... | Achroanthos..... | Gyrostachys..... | |
| Corallorhiza..... | Leptorchis..... | Peramium..... | |
| Aplectrum..... | Cathea..... | Achroanthos..... | |
| | Aplectrum..... | Leptorchis..... | Corallorhiza..... |
| | <i>Juglandaceae.</i> | | |
| | Juglans..... | Cathea..... | |
| | Scoria..... | Aplectrum..... | |
| | <i>Myricaceae.</i> | Juglans..... | |
| | Myrica..... | Scoria..... | |
| Populus..... | <i>Salicaceae.</i> | Myrica..... | |
| Salix..... | | Populus..... | Salix..... |
| | <i>Betulaceae.</i> | | |
| Ostrya..... | Carpinus..... | | |
| Corylus..... | Ostrya..... | Carpinus..... | |
| Betula..... | | Ostrya..... | |
| Alnus..... | | Corylus..... | |
| | <i>Fagaceae.</i> | Betula..... | Alnus..... |
| | Quercus..... | | |
| | <i>Ulmaceae.</i> | | Quercus..... |
| Celtis..... | Ulmus..... | Ulmus..... | |
| | Celtis..... | Celtis..... | Celtis..... |
| | <i>Moraceae.</i> | | |
| Humulus..... | Morus..... | Morus..... | |
| | Humulus..... | Humulus..... | Humulus..... |
| | <i>Urticaceae.</i> | | |
| | Urtica..... | | Urtica..... |
| | Laportea..... | Laportea..... | |
| | Adicea..... | Adicea..... | |
| | Ramium..... | Ramium..... | |
| | Parietaria..... | Parietaria..... | Parietaria..... |
| Comandra..... | <i>Santalaceae.</i> | | |
| | Aristolochiaceae..... | Comandra..... | |
| | Asarum..... | Asarum..... | Asarum..... |
| | Aristolochia..... | Aristolochia..... | |
| | <i>Polygonaceae.</i> | | |
| Polygonum..... | Rumex..... | | Rumex..... |
| | <i>Chenopodiaceae.</i> | | Polygonum..... |
| Chenopodium..... | | | Chenopodium..... |
| Corispermum..... | Salsola..... | Salsola..... | Corispermum..... |

C. Table Illustrating Continental Development of Genera Represented in the Minnesota Valley.—Continued.

| NORTHERN. | SOUTHERN. | EASTERN. | WESTERN. |
|-------------------|----------------------------------|----------------------|---------------------|
| | <i>Amara</i> <i>ntaceae.</i> | | |
| | Acnide | Acnide | |
| | Froelichia | Froelichia | |
| | Amaranthus | | Amaranthus |
| | <i>Phytola</i> <i>ceaceae.</i> | | |
| | Phytolacca | Phytolacca | |
| | <i>Nyctagi</i> <i>naceae.</i> | | |
| | Mirabilis | Mirabilis | |
| | <i>Portul</i> <i>acaeae.</i> | | |
| | Talinum | | Talinum |
| Claytonia | Portulaca | Portulaca | Claytonia |
| | <i>Caryop</i> <i>hyllaceae.</i> | | |
| Silene | | | Silene |
| Stellularia | | | Stellularia |
| Cerastium | | | Cerastium |
| Moehringia | | | Moehringia |
| | Anychia | Anychia | |
| | <i>Nymph</i> <i>aeaceae.</i> | | |
| | Nelumbo | Nelumbo | |
| | Brasenia | Brasenia | |
| | Leuconymphaea | Leuconymphaea | |
| Nymphaea | | Nymphaea | |
| | <i>Ceratop</i> <i>hyllaceae.</i> | | |
| | Ceratophyllum | Ceratophyllum | Ceratophyllum |
| | <i>Ranunc</i> <i>ulaceae.</i> | | |
| Hydrastis | | Hydrastis | |
| Caltha | | Caltha | Caltha |
| Isopyrum | | | Isopyrum |
| Actaea | | Actaea | Actaea |
| Aquilegia | | | Aquilegia |
| | Delphinium | | Delphinium |
| Anemone | | Anemone | |
| | Clematis | Clematis | |
| Oxygraphis | | | Oxygraphis |
| Ranunculus | | | Ranunculus |
| Thalictrum | | Thalictrum | |
| | <i>Berber</i> <i>idaceae.</i> | | |
| | Podophyllum | Podophyllum | |
| Leontice | | Leontice | |
| | <i>Menispe</i> <i>rmaceae.</i> | | |
| Menispermum | | Menispermum | |
| | <i>Papav</i> <i>eraceae.</i> | | |
| Sanguinaria | | Sanguinaria | |
| Capnorchis | | | Capnorchis |
| Neckeria | | | Neckeria |
| | <i>Cruci</i> <i>ferae.</i> | | |
| | Thelypodium | | Thelypodium |
| | Lepidium | | Lepidium |
| Sisymbrium | | | Sisymbrium |
| Barbarea | | Barbarea | Barbarea |
| | Nasturtium | Nasturtium | |
| Cardamine | | | Cardamine |
| | Lesquerella | | Lesquerella |
| Draba | | | Draba |
| Arabis | | | Arabis |
| Erysimum | | | Erysimum |
| | <i>Cappar</i> <i>idaceae.</i> | | |
| | Cleome | | Cleome |
| | Jacksonia | | Jacksonia |
| | <i>Sarrace</i> <i>niaceae.</i> | | |
| | Sarracenia | Sarracenia | |
| | <i>Droser</i> <i>aceae.</i> | | |
| | Drosera | Drosera | |
| | <i>Crassu</i> <i>laceae.</i> | | |
| | Penthorum | Penthorum | |
| | <i>Saxifra</i> <i>gaceae.</i> | | |
| Saxifraga | | | Saxifraga |
| Tiarella | | | Tiarella |
| Mitella | | | Mitella |
| Heuchera | | | Heuchera |
| | Chrysosplenium | Chrysosplenium | |
| Parnassia | | Parnassia | |
| Ribes | | | Ribes |

C. Table Illustrating Continental Development of Genera Represented in the Minnesota Valley.—*Continued.*

| NORTHERN. | SOUTHERN. | EASTERN. | WESTERN. |
|-------------------|-------------------------------|----------------------|------------------|
| Opulaster | <i>Rosa</i> <i>ceae.</i> | Opulaster | Opulaster |
| Spiraea | | Spiraea | Spiraea |
| Pirus | | Pirus | |
| Amelanchier | | Amelanchier | |
| Rubus | Crataegus | Crataegus | |
| Fragaria | | Rubus | Fragaria |
| Potentilla | | | Potentilla |
| Geum | | Geum | |
| | Agrimonia | Agrimonia | |
| | Rosa | Rosa | |
| | Prunus | Prunus | |
| | Cerasus | Cerasus | |
| | <i>Legum</i> <i>inosae.</i> | | |
| | Acuania | | Acuania |
| | Cassia | Cassia | |
| | Gymnocladus | Gymnocladus | |
| | Lupinus | | Lupinus |
| | Lotus | | Lotus |
| | Psoralea | | Psoralea |
| | Dalea | | Dalea |
| | Kuhnistera | | Kuhnistera |
| | Amorpha | | Amorpha |
| Astragalus | Cracca | Cracca | Astragalus |
| Spiesia | | | Spiesia |
| | Glycyrrhiza | Glycyrrhiza | |
| | Pleurolobus | Pleurolobus | |
| | Lespedeza | Lespedeza | |
| | Vicia | Vicia | |
| | Lathyrus | | Lathyrus |
| | Apios | Apios | |
| | Phaseolus | Phaseolus | |
| | Falcata | Falcata | |
| | Baptisia | Baptisia | |
| | <i>Gerani</i> <i>aceae.</i> | | |
| | Geranium | | Geranium |
| | <i>Oxalid</i> <i>aceae</i> | | |
| | Oxalis | Oxalis | |
| | <i>Lina</i> <i>ceae.</i> | | |
| | Linum | | Linum |
| | <i>Ruta</i> <i>ceae.</i> | | |
| | Zanthoxylum | Zanthoxylum | |
| | Ptelea | Ptelea | |
| | <i>Polyga</i> <i>laceae.</i> | | |
| | Polygala | Polygala | |
| | <i>Euphor</i> <i>biaceae.</i> | | |
| | Ricinocarpus | Ricinocarpus | |
| | Euphorbia | Euphorbia | |
| | <i>Stellar</i> <i>iaceae.</i> | | |
| | Stellaria | | Stellaria |
| | <i>Anacar</i> <i>diaceae.</i> | | |
| | Rhus | Rhus | |
| | <i>Celast</i> <i>raceae.</i> | | |
| | Evonymus | | Evonymus |
| | Celastrus | Celastrus | Celastrus |
| | <i>Aguifo</i> <i>liaceae.</i> | | |
| | Ilex | Ilex | |
| | <i>Staphy</i> <i>leaceae.</i> | | |
| | Staphylea | Staphylea | Staphylea |
| | <i>Acera</i> <i>ceae.</i> | | |
| Acer | Acer | | |
| | <i>Balsam</i> <i>inaceae.</i> | | |
| | Impatiens | Impatiens | |
| | <i>Rham</i> <i>naceae.</i> | | |
| | Ceanothus | | Ceanothus |
| Rhamnus | Rhamnus | | Rhamnus |
| | <i>Vita</i> <i>ceae.</i> | | |
| | Parthenocissus | Parthenocissus | |
| | Vitis | Vitis | |
| | <i>Tilia</i> <i>ceae.</i> | | |
| | Tilia | Tilia | |
| | <i>Malv</i> <i>aceae.</i> | | |
| | Malva | | Malva |
| | Napaea | Napaea | |
| | Hibiscus | Hibiscus | |

**C. Table Illustrating Continental Development of Genera
Represented in the Minnesota Valley.—Continued.**

| NORTHERN. | SOUTHERN. | EASTERN. | WESTERN. |
|---------------------|-------------------|-------------------|---------------------|
| | <i>Cista</i> | <i>ceae.</i> | |
| Hudsonia..... | Hellanthemum..... | Hellanthemum..... | |
| | <i>Hyper</i> | <i>icaceae.</i> | |
| | Hypericum..... | Hypericum..... | |
| Viola..... | <i>Viol</i> | <i>aceae.</i> | |
| | <i>Cact</i> | <i>aceae.</i> | |
| | Opuntia..... | | Opuntia..... |
| | <i>Thymel</i> | <i>aeaceae.</i> | |
| | Direa..... | Direa..... | Direa..... |
| | <i>Elaeagn</i> | <i>naceae.</i> | |
| Elaeagnus..... | Leptargyrea..... | Leptargyrea..... | Leptargyrea..... |
| | <i>Lythr</i> | <i>aceae.</i> | |
| | Lythrum..... | Lythrum..... | |
| | <i>Oenothe</i> | <i>raceae.</i> | |
| | Isnardia..... | Isnardia..... | |
| Epilobium..... | Gaura..... | | Gaura..... |
| Circaea..... | | | Epilobium..... |
| | Oenothera..... | Circaea..... | Oenothera..... |
| | <i>Halorrha</i> | <i>gidaceae.</i> | |
| Hippuris..... | | Hippuris..... | |
| | Myriophyllum..... | Myriophyllum..... | |
| | <i>Arali</i> | <i>aceae.</i> | |
| | Aralia..... | Aralia..... | |
| | <i>Umbell</i> | <i>iferae.</i> | |
| Sanicula..... | | | Sanicula..... |
| | Eryngium..... | Eryngium..... | |
| | Polytaenia..... | | Polytaenia..... |
| Heracleum..... | | | Heracleum..... |
| Peucedanum..... | Peucedanum..... | | Peucedanum..... |
| Angelica..... | Tiedemannia..... | Tiedemannia..... | Angelica..... |
| | Thaspium..... | Thaspium..... | |
| | Zizia..... | Zizia..... | |
| | Pimpinella..... | Pimpinella..... | Pimpinella..... |
| | Cicuta..... | Cicuta..... | Cicuta..... |
| | Sium..... | | Sium..... |
| | Deeringia..... | Deeringia..... | |
| | Myrrhis..... | | Myrrhis..... |
| | <i>Corn</i> | <i>aceae.</i> | |
| Cornus..... | | Cornus..... | |
| | <i>Pirol</i> | <i>aceae.</i> | |
| Pseva..... | | Pseva..... | |
| Pirola..... | | Pirola..... | Pirola..... |
| Monotropa..... | | | Monotropa..... |
| | <i>Eric</i> | <i>aceae.</i> | |
| Ledum..... | | Ledum..... | |
| Andromeda..... | | Andromeda..... | Andromeda..... |
| | <i>Lyonia</i> | <i>Lyonia</i> | |
| Chiogenes..... | | Chiogenes..... | |
| Arctostaphylos..... | | | Arctostaphylos..... |
| Oxycoccus..... | | Oxycoccus..... | |
| Vaccinium..... | | Vaccinium..... | |
| | <i>Primu</i> | <i>laceae.</i> | |
| Androsace..... | | | Androsace..... |
| | Lysimachia..... | Lysimachia..... | |
| | Steironema..... | Steironema..... | |
| | Trientalis..... | | Trientalis..... |
| | Centunculus..... | Centunculus..... | |
| | <i>Olea</i> | <i>ceae.</i> | |
| | Fraxinus..... | Fraxinus..... | |
| | <i>Gentia</i> | <i>naceae.</i> | |
| Menyanthes..... | | | Menyanthes..... |
| Gentiana..... | Nymphodes..... | Nymphodes..... | Gentiana..... |
| | <i>Apocyn</i> | <i>aceae.</i> | |
| | Apocynum..... | Apocynum..... | Apocynum..... |
| | <i>Asclepia</i> | <i>daceae.</i> | |
| | Asclepias..... | Asclepias..... | |
| | <i>Convolv</i> | <i>ulaceae.</i> | |
| | Volvulus..... | Volvulus..... | |
| | Cuscuta..... | Cuscuta..... | |

C. Table Illustrating Continental Development of Genera Represented in the Minnesota Valley.—Continued.

| NORTHERN. | SOUTHERN. | EASTERN. | WESTERN. |
|----------------|--------------------------|--------------|----------------|
| | <i>Polemoniaceae.</i> | | |
| Collomia | Phlox | Phlox | Collomia |
| Polemonium | | | Polemonium |
| | <i>Hydrophyllaceae.</i> | | |
| | Macrocalyx | | Macrocalyx |
| | Hydrophyllum | Hydrophyllum | |
| | Phacelia | | Phacelia |
| | <i>Borraginaceae.</i> | | |
| | Onosmodium | Onosmodium | |
| | Lithospermum | Lithospermum | |
| Myosotis | | Myosotis | |
| Cynoglossum | | | Cynoglossum |
| | <i>Verbenaceae.</i> | | |
| | Leptostachya | Leptostachya | |
| | Verbena | Verbena | |
| | <i>Labiatae.</i> | | |
| Teucrium | | Teucrium | Teucrium |
| | Isanthus | Isanthus | |
| Mentha | | Mentha | Mentha |
| | Lycopus | Lycopus | |
| | Koellia | Koellia | |
| | Acinos | Acinos | |
| | Hedeoma | Hedeoma | |
| | Monarda | Monarda | |
| | Vleckia | Vleckia | |
| Dracocephalum | | | Dracocephalum |
| | Physostegia | Physostegia | |
| Brunella | Brunella | Brunella | Brunella |
| | Scutellaria | Scutellaria | |
| | Stachys | | Stachys |
| | <i>Solanaceae.</i> | | |
| | Physalis | | Physalis |
| | Solanum | Solanum | |
| | <i>Scrophulariaceae.</i> | | |
| Scrophularia | | | Scrophularia |
| | Chelone | Chelone | |
| Penstemon | | | Penstemon |
| | Mimulus | Mimulus | Mimulus |
| | Gratiola | Gratiola | |
| | Ilysanthes | Ilysanthes | |
| Veronica | | Veronica | |
| | Synthyris | | Synthyris |
| | Gerardia | Gerardia | |
| | Castilleja | | Castilleja |
| Pedicularis | | | Pedicularis |
| Melampyrum | | | Melampyrum |
| | Monniera | Monniera | |
| | <i>Lentibulariaceae.</i> | | |
| | Utricularia | Utricularia | |
| | <i>Orobanchaceae.</i> | | |
| Aphyllon | | | Aphyllon |
| | <i>Plantaginaceae.</i> | | |
| | Plantago | Plantago | Plantago |
| | <i>Rubiaceae.</i> | | |
| | Houstonia | | Houstonia |
| Galium | | Galium | Galium |
| | <i>Caprifoliaceae.</i> | | |
| Linnaea | | Linnaea | Linnaea |
| Symphoricarpos | | | Symphoricarpos |
| Lonicera | | Lonicera | |
| | Diervilla | Diervilla | |
| | Triosteum | Triosteum | |
| Sambucus | | | Sambucus |
| | Viburnum | Viburnum | |
| | <i>Adoxaceae.</i> | | |
| Adoxa | | | Adoxa |
| | <i>Valerianaceae.</i> | | |
| | Valeriana | Valeriana | |
| Valerianella | | Valerianella | |
| | <i>Cucurbitaceae.</i> | | |
| | Sicyos | Sicyos | |
| | Micrampelis | | Micrampelis |
| | <i>Campanulaceae.</i> | | |
| Campanula | | Campanula | Campanula |
| | Pentagonia | Pentagonia | Pentagonia |
| | Lobelia | Lobelia | |

C. Table Illustrating Continental Development of Genera Represented in the Minnesota Valley.—Continued.

| NORTHERN. | SOUTHERN. | EASTERN. | WESTERN. |
|------------------|--------------------|------------------|------------------|
| | <i>Compositae.</i> | | |
| | Vernonia..... | Vernonia..... | |
| | Eupatorium..... | Eupatorium..... | |
| | Kuhnia..... | | Kuhnia..... |
| | Laciniaria..... | Laciniaria..... | |
| | Grindella..... | | Grindella..... |
| | Diplogon..... | Diplogon..... | |
| | Solidago..... | Solidago..... | |
| | Haplopappus..... | | Haplopappus..... |
| | Boltonia..... | Boltonia..... | |
| | Aster..... | Aster..... | |
| Erigeron..... | | | Erigeron..... |
| Antennaria..... | | | Antennaria..... |
| Anaphalis..... | | Anaphalis..... | Anaphalis..... |
| Gnaphalium..... | | | Gnaphalium..... |
| Adenocaulon..... | | | Adenocaulon..... |
| | Polymnia..... | Polymnia..... | |
| | Silphium..... | Silphium..... | |
| | Parthenium..... | | Parthenium..... |
| | Cyclachaena..... | | Cyclachaena..... |
| | Ambrosia..... | | Ambrosia..... |
| Xanthium..... | | Xanthium..... | Xanthium..... |
| | Heliopsis..... | | Heliopsis..... |
| | Rudbeckia..... | Rudbeckia..... | |
| | Helianthus..... | Helianthus..... | |
| | Coreopsis..... | Coreopsis..... | |
| | Bidens..... | Bidens..... | |
| | Helenium..... | | Helenium..... |
| | Gaillardia..... | | Gaillardia..... |
| | Dyssodia..... | | Dyssodia..... |
| Achillea..... | | | Achillea..... |
| | Erechthites..... | Erechthites..... | |
| Artemisia..... | | | Artemisia..... |
| | Senecio..... | | Senecio..... |
| Cnicus..... | | | Cnicus..... |
| Lactuca..... | | Lactuca..... | |
| | Taraxacum..... | | Taraxacum..... |
| | Nothocalais..... | | Nothocalais..... |
| | Agoseris..... | | Agoseris..... |
| | Adopogon..... | Adopogon..... | |
| | Lygodesmia..... | | Lygodesmia..... |
| | Prenanthes..... | Prenanthes..... | |
| Crepis..... | | | Crepis..... |
| Hieracium..... | | | Hieracium..... |

From the preceding table, statistics may be compiled as from the table of general generic range. Four range-elements may be discovered in the genera of the Minnesota valley and the mutual relations of these range-elements to the taxonomic groups may be determined, as before, by percentages. The four range-elements are as follows:

- A. The Northern generic element.
- B. The Southern generic element.
- C. The Eastern generic element.
- D. The Western generic element.

Each of these may be examined in turn

11. The Northern Generic Element.

| | No. of genera. | Per cent. of all Northern. | Northern per cent. of each. |
|---------------------------------------|----------------|----------------------------|-----------------------------|
| Monocotyledones..... | 50 | 30.6 | 47.6 |
| Archichlamydeae | 67 | 41.6 | 37.9 |
| Metachlamydeae | 46 | 28.2 | 35.9 |
| Total Northern..... | 163 | | |
| Northern per cent. of all genera..... | 39.9 | | |

In the above the 47.6 per cent. of monocotyledonous genera that range north rather than south is interestingly in excess of the 37.9 per cent. of Archichlamydeae and the 35.9 per cent. of Metachlamydeae. In the following table the preponderant southern ranges of the two higher groups of Metaspermae is indicated.

12. The Southern Generic Element.

| | No. of genera. | Per cent. of all Southern. | Southern per cent. of each. |
|---------------------------------|----------------|----------------------------|-----------------------------|
| Monocotyledones | 62 | 24.3 | 59.0 |
| Archichlamydeae | 111 | 43.3 | 63.4 |
| Metachlamydeae | 81 | 31.8 | 63.2 |
| Total Southern | 254 | | |
| South'n per cent. of all genera | 62.2 | | |

The excess of southern over northern ranges is observed from both tables, preceding. The differences are greatest for the Metachlamydeae, between 35.9 per cent. and 63.2 per cent., and least for the Monocotyledones, between 47.6 per cent. and 59.0 per cent., respectively. This result is quite in keeping with the results previously obtained and indicates the greater cosmopolitan character of the Monocotyledones. Passing to the other two tables of this group we note the relation between eastern and western genera.

13. The Eastern Generic Element.

| | No. of genera. | Per cent of all Eastern. | Eastern per ct. of each. |
|---------------------------------|-------------------|-----------------------------|-----------------------------|
| Monocotyledones | 85 | 31.4 | 80.9 |
| Archichlamydeae | 107 | 39.6 | 61.1 |
| Metachlamydeae | 78 | 28.9 | 60.9 |
| Total Eastern | 270 | | |
| Eastern per cent. of all genera | 66.1 | | |

The third column of the table above furnishes the largest percentage figure of any of the tables. The 80.9 per cent. of eastern-ranging monocotyledonous genera indicates sufficiently the eastern preponderance of this taxonomic group, as represented in the valley of the Minnesota. The lower percentage of the Metachlamydeae will be understood better in connection with the following table:

14. The Western Generic Element.

| | No. of genera. | Per cent. of all Western. | Western per cent. of each |
|---------------------------------|-------------------|------------------------------|------------------------------|
| Monocotyledones | 36 | 14.1 | 44.8 |
| Archichlamydeae | 84 | 45.8 | 34.2 |
| Metachlamydeae | 63 | 34.4 | 49.0 |
| Total Western | 183 | | |
| Western per cent. of all genera | 44.8 | | |

By a comparison of the two tables preceding it is noted that the differences are widest between the Monocotyledones, and narrowest between the Metachlamydeae. By genera, then, the Monocotyledones are most evenly distributed north and south while the Metachlamydeae are most evenly distributed east and west. The evident importance of this fact, thus determined, lies in the exact parallelism which it maintains with others derived above. The Metachlamydeae, being peculiarly the central and

younger element, may be expected to mass themselves more distinctly in lines parallel with the general continental tension-line. The Monocotyledones, being peculiarly the older and more generally distributed element, may be expected to manifest dissipation over the different degrees of latitude. This they are found to manifest, so the relative development of the two groups is admirably exhibited by these data of comparative latitudinal and longitudinal distribution.

The total per cents. are of importance, too, as determining in a preliminary way the character of the Minnesota valley flora, so far as regards its North American distribution. We find that the relations are as follows:

| | |
|------------------------|--|
| Total Northern.....163 | Northern per cent. of all genera....39.9 |
| Total Southern.....254 | Southern per cent. of all genera....62.2 |
| Total Eastern.....270 | Eastern per cent. of all genera.....66.1 |
| Total Western.....183 | Western per cent. of all genera.....44.8 |

So far then as may be indicated by the genera of metaspermic plants, the valley of the Minnesota is much more eastern and southern in its character than northern or western. Although generally regarded as a northern district, it is seen to be least characterised by this range-element. While continentally central it is by no means botanically central, but is peculiarly an Atlantic coast and a southern region. The explanation of this may be deferred until the examination of the species-distribution has been completed.

III. EXAMINATION OF SPECIES REPRESENTED IN THE MINNESOTA VALLEY.

Since 73.0 per cent. of the species in the Minnesota valley native metaspermic flora are limited to the North American continent it will hardly be worth while to attempt any extended examination of them along the lines of Table A or Table B. The extra-continental element may be isolated for study and the remainder which will consist of the endemic species may be classified as were the genera in Table C. The area occupied by a species is, as De Candolle has shown, in general either circular or elliptical. The species which are found in the Minnesota metaspermic flora are without exception to be found also outside of the basin. Each species or variety occupies such an elliptical or circular area as may be

peculiar to it. Sometimes this area will be almost coextensive with that of the continent; again it will be comparatively restricted. Of the first condition *Typha latifolia* is a good example; of the second *Synthyris houghtoniana* may be cited. In most cases, however, if the area of the species should be drawn on a map, such area would always be cut by one or both of the two median lines which have been established as dividing the continent into northern and southern, eastern and western portions. If, now, the two lines of 95° W. long. and 45° N. lat. chance to cut any specific area into four approximately equal areas, such a species may be entered in the tabulation as of north, east, south and west distribution. But if one of the areas is very distinctly less than the other three, or if two are much less than the opposite two, the species may be entered in three of the four, or in two of the four divisions. As in the case of the genera, when similarly tabulated, no very rigid circumscribing line has been drawn for any species, for in almost every case the absolute east, west, north or south limit of a species is only approximately determined. Where any doubt about preponderant range has been felt the species has been entered in both of the groups. The evident result is that

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|--------------------------------------|--------------------------------------|
| <i>Typha</i> <i>aceae</i> . | |
| <i>Typha latifolia</i> | <i>Typha latifolia</i> |
| <i>Sparga</i> <i>niaceae</i> . | |
| <i>Sparganium simplex</i> | |
| <i>Sparganium androcladum</i> | <i>Sparganium androcladum</i> |
| <i>Sparganium eurycarpum</i> | <i>Sparganium eurycarpum</i> |
| <i>Potamogeton</i> <i>aceae</i> . | |
| <i>Potamogeton natans</i> | <i>Potamogeton natans</i> |
| <i>Potamogeton fluitans</i> | <i>Potamogeton fluitans</i> |
| <i>Potamogeton amplifolius</i> | <i>Potamogeton amplifolius</i> |
| <i>Potamogeton perfoliatus</i> | <i>Potamogeton perfoliatus</i> |
| <i>Potamogeton heterophyllos</i> ... | |
| <i>Potamogeton gramineus</i> var. | <i>Potamogeton gramineus</i> var. |
| <i>zizii</i> | <i>zizii</i> |
| <i>Potamogeton rutilus</i> | |
| | <i>Potamogeton illinoensis</i> |
| <i>Potamogeton pectinatus</i> | <i>Potamogeton pectinatus</i> |
| <i>Potamogeton pusillus</i> | <i>Potamogeton pusillus</i> |
| <i>Potamogeton lucens</i> | <i>Potamogeton lucens</i> |

the final differences, numerical and percentage, are produced rather by the unequal entry of species regarding the preponderant range, of which there is little question, while those which are entered as both north and south, as both east and west, or as all four, by adding to two columns equally do not alter the general averages. In this way I have thought to give a more accurate account of the range of Minnesota valley Metaspermae, outside of the valley, than by any effort to strike a ratio of preponderance for every species and variety. The areas have been drawn on a map, in most cases, before their description was attempted. The limiting lines for the areas were derived from the range-descriptions compiled for each species in the body of the list. It cannot but be apparent how numerous and insidious are the opportunities for error in this list. To test the probable range of error the writer has, at considerable intervals, compiled the table three different times. The three tables were different, but the average range of variation from the mean, for all statistics was but 1.88 per cent., so it is believed that the table, as finally presented, is of approximate accuracy.

of Minnesota Valley Metaspermic Species.

| EASTERN. | WESTERN. |
|--|------------------------------|
| <i>Typha</i> <i>aceae.</i> | |
| Typha latifolia..... | Typha latifolia..... |
| <i>Spargania</i> <i>niaceae.</i> | |
| Sparganium simplex..... | Sparganium simplex..... |
| Sparganium androcladum..... | Sparganium androcladum..... |
| Sparganium eurycarpum..... | |
| <i>Potamogeton</i> <i>etonaceae.</i> | |
| Potamogeton natans..... | Potamogeton natans..... |
| Potamogeton fluitans..... | Potamogeton fluitans..... |
| Potamogeton amplifolius..... | Potamogeton amplifolius..... |
| Potamogeton perfoliatus..... | |
| Potamogeton heterophyllos.... | Potamogeton heterophyllos... |
| Potamogeton gramineus var. zizii..... | |
| Potamogeton rutilus..... | Potamogeton rutilus..... |
| Potamogeton illinoensis..... | |
| Potamogeton pectinatus..... | Potamogeton pectinatus..... |
| Potamogeton pusillus..... | Potamogeton pusillus..... |
| Potamogeton lucens..... | Potamogeton lucens..... |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|---------------------------------------|---------------------------------------|
| Potamogeton praelongus..... | |
| Potamogeton lanceolatus..... | Potamogeton lanceolatus..... |
| Potamogeton zosteræfolius..... | |
| Potamogeton foliosus..... | |
| Zanichellia palustris..... | Zanichellia palustris..... |
| | <i>Najas</i> <i>daceae</i> . |
| Najas flexilis..... | Najas flexilis..... |
| | <i>Junca</i> <i>gineae</i> . |
| Triglochin palustris..... | |
| Triglochin maritima..... | |
| Scheuchzeria palustris..... | |
| | <i>Alisma</i> <i>aceae</i> . |
| Alisma plantago..... | |
| | Sagittaria rigida..... |
| | Sagittaria graminea..... |
| Sagittaria sagittæfolia..... | |
| | <i>Hydroch</i> <i>aritaceae</i> . |
| Elodea canadensis..... | Elodea canadensis..... |
| | Vallisneria spiralis..... |
| | <i>Gram</i> <i>ineae</i> . |
| | Andropogon nutans..... |
| | Andropogon provincialis..... |
| | Andropogon scoparius..... |
| | Panicum crus-galli var. hispidum..... |
| | Panicum dichotomum..... |
| Panicum depauperatum..... | Panicum depauperatum..... |
| | Panicum scoparium..... |
| | Panicum latifolium..... |
| Panicum xanthophysum..... | |
| | Panicum virgatum..... |
| | Panicum nudum..... |
| Panicum capillare..... | Panicum capillare..... |
| | Cenchrus tribuloides..... |
| | Zizania aquatica..... |
| Homalocenchrus oryzoides..... | Homalocenchrus oryzoides... |
| | Homalocenchrus virginicus... |
| Phalaris arundinacea..... | |
| Hierochloë odorata var. fragrans..... | |
| | Aristida purpurea..... |
| Aristida basiramea..... | Aristida basiramea..... |
| Stipa spartea..... | Stipa spartea..... |
| Oryzopsis juncea..... | |
| Oryzopsis asperifolia..... | |

of Minnesota Valley Metaspermic Species.

| EASTERN. | WESTERN. |
|---------------------------------------|---------------------------------------|
| Potamogeton praelongus..... | Potamogeton praelongus..... |
| Potamogeton lanceolatus..... | Potamogeton lanceolatus..... |
| Potamogeton zosteræfolius.... | Potamogeton zosteræfolius.... |
| Potamogeton foliosus..... | Potamogeton foliosus..... |
| Zanichellia palustris..... | Zanichellia palustris..... |
| <i>Najas</i> daceae. | |
| Najas flexilis..... | Najas flexilis..... |
| <i>Juncus</i> gineae. | |
| Triglochin palustris..... | Triglochin palustris..... |
| Triglochin maritima..... | Triglochin maritima..... |
| Scheuchzeria palustris..... | Scheuchzeria palustris..... |
| <i>Alisma</i> aceae. | |
| Alisma plantago..... | Alisma plantago..... |
| Sagittaria rigida..... | |
| Sagittaria graminea..... | |
| Sagittaria sagittæfolia..... | Sagittaria sagittæfolia..... |
| <i>Hydrocharitaceae</i> . | |
| Elodea canadensis..... | Elodea canadensis..... |
| Vallisneria spiralis..... | |
| <i>Gramineae</i> . | |
| Andropogon nutans..... | |
| Andropogon provincialis..... | |
| Andropogon scoparius..... | |
| Panicum crus-galli var. hispidum..... | |
| Panicum dichotomum..... | Panicum dichotomum..... |
| Panicum depauperatum..... | |
| Panicum scoparium..... | Panicum scoparium..... |
| Panicum latifolium..... | |
| Panicum xanthophyllum..... | |
| Panicum virgatum..... | |
| | Panicum nudum..... |
| Panicum capillare..... | Panicum capillare..... |
| Cenchrus tribuloides..... | Cenchrus tribuloides..... |
| Zizania aquatica..... | |
| Homalocenchrus oryzoides.... | Homalocenchrus oryzoides.... |
| Homalocenchrus virginicus.... | |
| Phalaris arundinacea..... | Phalaris arundinacea..... |
| Hierochloë odorata var. fragrans..... | Hierochloë odorata var. fragrans..... |
| | Aristida purpurea..... |
| | Aristida basiramea..... |
| | Stipa spartea..... |
| Oryzopsis juncea..... | Oryzopsis juncea..... |
| Oryzopsis asperifolia..... | Oryzopsis asperifolia..... |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN |
|---|---|
| <i>Oryzopsis melanocarpa</i> | <i>Oryzopsis melanocarpa</i> |
| | <i>Muhlenbergia diffusa</i> |
| | <i>Muhlenbergia tenuiflora</i> |
| | <i>Muhlenbergia ambigua</i> |
| | <i>Muhlenbergia mexicana</i> |
| <i>Muhlenbergia racemosa</i> | <i>Muhlenbergia racemosa</i> |
| | <i>Muhlenbergia sobolifera</i> |
| | <i>Brachyelytrum aristosum</i> |
| <i>Alopecurus geniculatus</i> var. | <i>Alopecurus geniculatus</i> var. |
| <i>aristulatus</i> | <i>aristulatus</i> |
| | <i>Sporobolus cryptandrus</i> |
| | <i>Sporobolus heterolepis</i> |
| | <i>Sporobolus junceus</i> |
| | <i>Sporobolus depauperatus</i> |
| <i>Sporobolus cuspidatus</i> | <i>Sporobolus cuspidatus</i> |
| | <i>Sporobolus vaginaeflorus</i> |
| | <i>Sporobolus asper</i> |
| <i>Cinna arundinacea</i> | <i>Cinna arundinacea</i> |
| <i>Agrostis hiemalis</i> | <i>Agrostis hiemalis</i> |
| <i>Agrostis rubra</i> var. <i>alpina</i> | <i>Agrostis rubra</i> var. <i>alpina</i> |
| <i>Agrostis perennans</i> | <i>Agrostis perennans</i> |
| <i>Deyeuxia neglecta</i> | |
| <i>Deyeuxia canadensis</i> | |
| | <i>Ammophila longifolia</i> |
| <i>Deschampsia caespitosa</i> | |
| <i>Avena striata</i> | |
| <i>Danthonia spicata</i> | <i>Danthonia spicata</i> |
| <i>Spartina cynosuroides</i> | <i>Spartina cynosuroides</i> |
| | <i>Schedonnardus paniculatus</i> ... |
| | <i>Bouteloua curtipendula</i> |
| | <i>Bouteloua hirsuta</i> |
| | <i>Bouteloua oligostachya</i> |
| <i>Beckmannia erucaeformis</i> | |
| | <i>Bulbilis dactyloides</i> |
| <i>Phragmites phragmites</i> | <i>Phragmites phragmites</i> |
| | <i>Eragrostis pectinacea</i> |
| | <i>Eragrostis purshii</i> |
| | <i>Eragrostis eragrostis</i> |
| | <i>Eragrostis hypnoides</i> |
| | <i>Eatonia obtusata</i> |
| <i>Eatonia pennsylvanica</i> | <i>Eatonia pennsylvanica</i> |
| <i>Koeleria cristata</i> | |
| <i>Poa nemoralis</i> | |
| <i>Poa palustris</i> | |
| <i>Poa compressa</i> | |

of Minnesota Valley Metaspermic Species.—*Continued.*

| EASTERN. | WESTERN. |
|---|---|
| <i>Oryzopsis melanocarpa</i> | |
| <i>Muhlenbergia diffusa</i> | |
| <i>Muhlenbergia tenuiflora</i> | |
| | <i>Muhlenbergia ambigua</i> |
| <i>Muhlenbergia mexicana</i> | <i>Muhlenbergia mexicana</i> |
| <i>Muhlenbergia racemosa</i> | <i>Muhlenbergia racemosa</i> |
| <i>Muhlenbergia sobolifera</i> | |
| <i>Brachyelytrum aristosum</i> | |
| <i>Alopecurus geniculatus</i> var. <i>aristulatus</i> | <i>Alopecurus geniculatus</i> var. <i>aristulatus</i> |
| <i>Sporobolus cryptandrus</i> | <i>Sporobolus cryptandrus</i> |
| <i>Sporobolus heterolepis</i> | |
| <i>Sporobolus junceus</i> | |
| | <i>Sporobolus depauperatus</i> |
| <i>Sporobolus cuspidatus</i> | |
| <i>Sporobolus vaginaeflorus</i> | |
| <i>Sporobolus asper</i> | |
| <i>Cinna arundinacea</i> | <i>Cinna arundinacea</i> |
| <i>Agrostis hiemalis</i> | <i>Agrostis hiemalis</i> |
| <i>Agrostis rubra</i> var. <i>alpina</i> | <i>Agrostis rubra</i> var. <i>alpina</i> |
| <i>Agrostis perennans</i> | <i>Agrostis perennans</i> |
| | <i>Deyeuxia neglecta</i> |
| <i>Deyeuxia canadensis</i> | <i>Deyeuxia canadensis</i> |
| | <i>Ammophila longifolia</i> |
| <i>Deschampsia caespitosa</i> | <i>Deschampsia caespitosa</i> |
| <i>Avena striata</i> | <i>Avena striata</i> |
| <i>Danthonia spicata</i> | <i>Danthonia spicata</i> |
| <i>Spartina cynosuroides</i> | <i>Spartina cynosuroides</i> |
| | <i>Schedonnardus paniculatus</i> ... |
| <i>Bouteloua curtipendula</i> | <i>Bouteloua curtipendula</i> |
| | <i>Bouteloua hirsuta</i> |
| | <i>Bouteloua oligostachya</i> |
| | <i>Beckmannia erucaeformis</i> ... |
| | <i>Bulbilis dactyloides</i> |
| <i>Phragmites phragmites</i> | <i>Phragmites phragmites</i> |
| <i>Eragrostis pectinacea</i> | |
| <i>Eragrostis purshii</i> | <i>Eragrostis purshii</i> |
| <i>Eragrostis eragrostis</i> | <i>Eragrostis eragrostis</i> |
| <i>Eragrostis hypnoides</i> | |
| <i>Eatonia obtusata</i> | <i>Eatonia obtusata</i> |
| <i>Eatonia pennsylvanica</i> | <i>Eatonia pennsylvanica</i> |
| <i>Koeleria cristata</i> | <i>Koeleria cristata</i> |
| <i>Poa nemoralis</i> | <i>Poa nemoralis</i> |
| <i>Poa palustris</i> | <i>Poa palustris</i> |
| | <i>Poa compressa</i> |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|--|--|
| <i>Scolochloa arundinacea</i> | |
| <i>Panicularia fluitans</i> | |
| <i>Panicularia americana</i> | |
| <i>Panicularia nervata</i> | <i>Panicularia nervata</i> |
| <i>Panicularia elongata</i> | |
| <i>Panicularia canadensis</i> | |
| | <i>Festuca natans</i> |
| <i>Festuca ovina</i> | <i>Festuca ovina</i> |
| | <i>Festuca octoflora</i> |
| | <i>Bromus purgans</i> |
| <i>Bromus ciliatus</i> | |
| <i>Bromus kalmii</i> | <i>Bromus kalmii</i> |
| <i>Agropyrum caninum</i> | <i>Agropyrum caninum</i> |
| <i>Agropyrum violaceum</i> | |
| <i>Agropyrum glaucum</i> var. oc- cidental ^s | |
| <i>Hordeum nodosum</i> | <i>Hordeum nodosum</i> |
| <i>Hordeum jubatum</i> | |
| | <i>Elymus elymoides</i> |
| | <i>Elymus striatus</i> |
| <i>Elymus canadensis</i> | <i>Elymus canadensis</i> |
| <i>Elymus virginicus</i> | <i>Elymus virginicus</i> |
| <i>Hystrix hystrix</i> | <i>Hystrix hystrix</i> |
| <i>Cyperaceae.</i> | |
| | <i>Hemicarpha micrantha</i> |
| <i>Dulichium spathaceum</i> | <i>Dulichium spathaceum</i> |
| | <i>Cyperus speciosus</i> |
| <i>Cyperus strigosus</i> | <i>Cyperus strigosus</i> |
| | <i>Cyperus strigosus</i> var. com- pressus..... |
| | <i>Cyperus esculentus</i> |
| | <i>Cyperus erythrorhizos</i> |
| | <i>Cyperus filiculmis</i> |
| <i>Cyperus schweinitzii</i> | |
| | <i>Cyperus aristatus</i> |
| | <i>Cyperus diandrus</i> |
| | <i>Cyperus diandrus</i> var. casta- neus..... |
| <i>Eriophorum virginicum</i> | <i>Eriophorum virginicum</i> |
| <i>Eriophorum gracile</i> | |
| <i>Eriophorum latifolium</i> | |
| <i>Eriophorum polystachion</i> | |
| <i>Eriophorum vaginatum</i> | |
| <i>Eriophorum cyperinum</i> | |
| | <i>Eriophorum lineatum</i> |

of Minnesota Valley Metaspermic Species.—*Continued.*

| EASTERN. | WESTERN. |
|---|---|
| | <i>Scölochloa arundinacea</i> |
| <i>Panicularia fluitans</i> | <i>Panicularia fluitans</i> |
| <i>Panicularia americana</i> | <i>Panicularia americana</i> |
| <i>Panicularia nervata</i> | <i>Panicularia nervata</i> |
| <i>Panicularia elongata</i> | |
| <i>Panicularia canadensis</i> | |
| <i>Festuca nutans</i> | |
| <i>Festuca ovina</i> | <i>Festuca ovina</i> |
| <i>Festuca octoflora</i> | <i>Festuca octoflora</i> |
| <i>Bromus purgans</i> | |
| <i>Bromus ciliatus</i> | <i>Bromus ciliatus</i> |
| <i>Bromus kalmii</i> | |
| <i>Agropyrum caninum</i> | <i>Agropyrum caninum</i> |
| <i>Agropyrum violaceum</i> | |
| <i>Agropyrum glaucum</i> var. <i>occidentalis</i> | <i>Agropyrum glaucum</i> var. <i>occidentalis</i> |
| | <i>Hordeum nodosum</i> |
| | <i>Hordeum jubatum</i> |
| | <i>Elymus elymoides</i> |
| <i>Elymus striatus</i> | |
| <i>Elymus canadensis</i> | <i>Elymus canadensis</i> |
| <i>Elymus virginicus</i> | |
| <i>Hystrix hystrix</i> | |
| <i>Cyperaceae.</i> | |
| <i>Hemicarpha micrantha</i> | <i>Hemicarpha micrantha</i> |
| <i>Dulichium spathaceum</i> | <i>Dulichium spathaceum</i> |
| <i>Cyperus speciosus</i> | |
| <i>Cyperus strigosus</i> | <i>Cyperus strigosus</i> |
| <i>Cyperus strigosus</i> var. <i>compressus</i> | |
| <i>Cyperus esculentus</i> | <i>Cyperus esculentus</i> |
| <i>Cyperus erythrorhizos</i> | <i>Cyperus erythrorhizos</i> |
| <i>Cyperus filiculmis</i> | |
| <i>Cyperus schweinitzii</i> | |
| <i>Cyperus aristatus</i> | <i>Cyperus aristatus</i> |
| <i>Cyperus diandrus</i> | |
| <i>Cyperus diandrus</i> var. <i>castaneus</i> | <i>Cyperus diandrus</i> var. <i>castaneus</i> |
| <i>Eriophorum virginicum</i> | |
| <i>Eriophorum gracile</i> | <i>Eriophorum gracile</i> |
| <i>Eriophorum latifolium</i> | <i>Eriophorum latifolium</i> |
| <i>Eriophorum polystachion</i> | <i>Eriophorum polystachion</i> |
| <i>Eriophorum vaginatum</i> | <i>Eriophorum vaginatum</i> |
| <i>Eriophorum cyperinum</i> | |
| <i>Eriophorum lineatum</i> | <i>Eriophorum lineatum</i> |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|---|--|
| Scirpus atrovirens..... | Scirpus atrovirens..... |
| Scirpus sylvaticus var. micro- carpus..... | |
| Scirpus fluviatilis..... | |
| Scirpus lacustris..... | Scirpus lacustris..... |
| Scirpus triangularis..... | Scirpus triangularis..... |
| | Heleocharis wolfii..... |
| Heleocharis acicularis..... | Heleocharis acicularis..... |
| Heleocharis tenuis..... | Heleocharis tenuis..... |
| Heleocharis intermedia..... | Heleocharis intermedia..... |
| | Heleocharis acuminata..... |
| Heleocharis palustris..... | Heleocharis palustris..... |
| | Heleocharis palustris var. glaucescens..... |
| Heleocharis ovata..... | Heleocharis ovata..... |
| | Iria capillaris..... |
| | Mariscus mariscoides..... |
| Rhynchospora setacea..... | Rhynchospora setacea..... |
| Rhynchospora alba..... | Rhynchospora alba..... |
| | Scleria verticillata..... |
| | Scleria triglomerata..... |
| Carex sychnocephala..... | Carex sychnocephala..... |
| | Carex straminea..... |
| Carex straminea var. brevior.. | Carex straminea var. brevior.. |
| | Carex straminea var. mirabilis |
| Carex foenea..... | |
| Carex adusta..... | |
| Carex scoparia..... | Carex scoparia..... |
| Carex tribuloides..... | Carex tribuloides..... |
| Carex tribuloides var. cristata. | Carex tribuloides var. cristata |
| Carex tribuloides var. bebbii.. | Carex tribuloides var. bebbii.. |
| Carex muskingumensis..... | Carex muskingumensis..... |
| Carex siccata..... | |
| Carex deweyana..... | Carex deweyana..... |
| Carex trisperma..... | |
| Carex tenuiflora..... | |
| Carex canescens..... | |
| Carex echinata var. radiata.... | Carex echinata var. radiata... |
| | Carex cephalophora..... |
| Carex muhlenbergii..... | Carex muhlenbergia..... |
| Carex rosea..... | Carex rosea..... |
| Carex rosea var. radiata..... | Carex rosea var. radiata..... |
| Carex tenella..... | |
| Carex sartwellii..... | |
| Carex vulpinoidea..... | |

of Minnesota Valley Metaspermic Species.—Continued.

| EASTERN. | WESTERN. |
|---|---|
| <i>Scirpus atrovirens</i> | <i>Scirpus atrovirens</i> |
| | <i>Scirpus sylvaticus</i> var. <i>micro-</i> |
| <i>Scirpus fluviatilis</i> | carpus..... |
| <i>Scirpus lacustris</i> | |
| <i>Scirpus triangularis</i> | <i>Scirpus lacustris</i> |
| | <i>Scirpus triangularis</i> |
| <i>Heleocharis acicularis</i> | <i>Heleocharis wolffi</i> |
| <i>Heleocharis tenuis</i> | <i>Heleocharis acicularis</i> |
| <i>Heleocharis intermedia</i> | |
| <i>Heleocharis acuminata</i> | |
| <i>Heleocharis palustris</i> | <i>Heleocharis palustris</i> |
| <i>Heleocharis palustris</i> var. | |
| <i>glaucescens</i> | |
| <i>Heleocharis ovata</i> | <i>Heleocharis ovata</i> |
| <i>Iria capillaris</i> | <i>Iria capillaris</i> |
| <i>Mariscus mariscoides</i> | <i>Mariscus mariscoides</i> |
| <i>Rhynchospora setacea</i> | |
| <i>Rhynchospora alba</i> | <i>Rhynchospora alba</i> |
| <i>Scleria verticillata</i> | |
| <i>Scleria triglomerata</i> | |
| <i>Carex sychnocephala</i> | |
| <i>Carex straminea</i> | <i>Carex straminea</i> |
| <i>Carex straminea</i> var. <i>brevior</i> .. | |
| <i>Carex straminea</i> var. <i>mirabilis</i> | |
| <i>Carex foenea</i> | <i>Carex foenea</i> |
| <i>Carex adusta</i> | <i>Carex adusta</i> |
| <i>Carex scoparia</i> | |
| <i>Carex tribuloides</i> | <i>Carex tribuloides</i> |
| <i>Carex tribuloides</i> var. <i>cristata</i> | <i>Carex tribuloides</i> var. <i>cristata</i> |
| <i>Carex tribuloides</i> var. <i>bebbii</i> ... | |
| <i>Carex muskingumensis</i> | |
| <i>Carex siccata</i> | <i>Carex siccata</i> |
| <i>Carex deweyana</i> | <i>Carex deweyana</i> |
| <i>Carex trisperma</i> | |
| <i>Carex tenuiflora</i> | |
| <i>Carex canescens</i> | <i>Carex canescens</i> |
| <i>Carex echinata</i> var. <i>radiata</i> ... | <i>Carex echinata</i> var. <i>radiata</i> ... |
| <i>Carex cephalophora</i> | |
| <i>Carex muhlbergii</i> | |
| <i>Carex rosea</i> | |
| <i>Carex rosea</i> var. <i>radiata</i> | |
| <i>Carex tenella</i> | <i>Carex tenella</i> |
| <i>Carex sartwellii</i> | <i>Carex sartwellii</i> |
| <i>Carex vulpinoidea</i> | |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|--|--|
| <i>Carex gravida</i> | <i>Carex gravida</i> |
| <i>Carex gravida</i> var. <i>laxifolia</i> ... | <i>Carex gravida</i> var. <i>laxifolia</i> .. |
| <i>Carex teretiuscula</i> | |
| <i>Carex teretiuscula</i> var. <i>ramosa</i> | <i>Carex crus-corvi</i> |
| <i>Carex stipata</i> | <i>Carex stipata</i> |
| | <i>Carex conjuncta</i> |
| <i>Carex stenophylla</i> | <i>Carex stenophylla</i> |
| <i>Carex chordorhiza</i> | |
| <i>Carex polytrichoides</i> | <i>Carex polytrichoides</i> |
| <i>Carex pubescens</i> | |
| <i>Carex pennsylvanica</i> | |
| <i>Carex varia</i> | <i>Carex varia</i> |
| <i>Carex pedunculata</i> | <i>Carex pedunculata</i> |
| <i>Carex richardsoni</i> | |
| <i>Carex eburnea</i> | |
| <i>Carex aurea</i> | |
| | <i>Carex tetanica</i> var. <i>meadii</i> ... |
| <i>Carex flava</i> var. <i>viridula</i> | <i>Carex laxiflora</i> |
| <i>Carex crawei</i> | <i>Carex crawei</i> |
| | <i>Carex granularis</i> |
| | <i>Carex grisea</i> |
| | <i>Carex davisii</i> |
| <i>Carex gracillima</i> | <i>Carex gracillima</i> |
| <i>Carex arctata</i> | <i>Carex arctata</i> |
| <i>Carex castanea</i> | |
| <i>Carex longirostris</i> | <i>Carex longirostris</i> |
| <i>Carex limosa</i> | |
| <i>Carex magellanica</i> | |
| <i>Carex crinita</i> | <i>Carex crinita</i> |
| <i>Carex prasina</i> | <i>Carex prasina</i> |
| <i>Carex aquatilis</i> | |
| <i>Carex stricta</i> | <i>Carex stricta</i> |
| <i>Carex fusca</i> | <i>Carex fusca</i> |
| <i>Carex riparia</i> | <i>Carex riparia</i> |
| <i>Carex trichocarpa</i> | <i>Carex trichocarpa</i> |
| <i>Carex trichocarpa</i> var. <i>aristata</i> | |
| <i>Carex filiformis</i> | |
| <i>Carex filiformis</i> var. <i>lanuginosa</i> | <i>Carex filiformis</i> var. <i>lanuginosa</i> |
| <i>Carex houghtonii</i> | |
| | <i>Carex squarrosa</i> |
| <i>Carex pseudocyperus</i> | |
| <i>Carex pseudocyperus</i> var. <i>americana</i> | <i>Carex pseudocyperus</i> var. <i>americana</i> |

of Minnesota Valley Metaspermic Species.—*Continued.*

| EASTERN. | WESTERN. |
|--|--|
| <i>Carex gravida</i> | |
| <i>Carex gravida</i> var. <i>laxifolia</i> | |
| <i>Carex teretiuscula</i> | <i>Carex teretiuscula</i> |
| <i>Carex teretiuscula</i> var. <i>ramosa</i> | <i>Carex teretiuscula</i> var. <i>ramosa</i> |
| <i>Carex crus-corvi</i> | |
| <i>Carex stipata</i> | <i>Carex stipata</i> |
| <i>Carex conjuncta</i> | |
| | <i>Carex stenophylla</i> |
| <i>Carex chordorhiza</i> | |
| <i>Carex polytrichoides</i> | <i>Carex polytrichoides</i> |
| <i>Carex pubescens</i> | |
| <i>Carex pennsylvanica</i> | <i>Carex pennsylvanica</i> |
| <i>Carex varia</i> | <i>Carex varia</i> |
| <i>Carex pedunculata</i> | <i>Carex pedunculata</i> |
| <i>Carex richardsoni</i> | <i>Carex richardsoni</i> |
| <i>Carex eburnea</i> | <i>Carex eburnea</i> |
| <i>Carex aurea</i> | <i>Carex aurea</i> |
| <i>Carex tetanica</i> var. <i>meadii</i> | |
| <i>Carex laxiflora</i> | |
| <i>Carex flava</i> var. <i>viridula</i> | <i>Carex flava</i> var. <i>viridula</i> |
| <i>Carex crawei</i> | |
| <i>Carex granularis</i> | |
| <i>Carex grisea</i> | <i>Carex grisea</i> |
| <i>Carex davisii</i> | |
| <i>Carex gracillima</i> | |
| <i>Carex arctata</i> | <i>Carex arctata</i> |
| <i>Carex castanea</i> | |
| <i>Carex longirostris</i> | <i>Carex longirostris</i> |
| <i>Carex limosa</i> | <i>Carex limosa</i> |
| <i>Carex magellanica</i> | <i>Carex magellanica</i> |
| <i>Carex crinita</i> | |
| <i>Carex prasina</i> | |
| <i>Carex aquatilis</i> | <i>Carex aquatilis</i> |
| <i>Carex stricta</i> | |
| <i>Carex fusca</i> | <i>Carex fusca</i> |
| <i>Carex riparia</i> | |
| <i>Carex trichocarpa</i> | |
| <i>Carex trichocarpa</i> var. <i>aristata</i> | <i>Carex trichocarpa</i> var. <i>aristata</i> |
| <i>Carex filiformis</i> | <i>Carex filiformis</i> |
| <i>Carex filiformis</i> var. <i>lanuginosa</i> | <i>Carex filiformis</i> var. <i>lanuginosa</i> |
| <i>Carex houghtonii</i> | <i>Carex houghtonii</i> |
| <i>Carex squarrosa</i> | |
| <i>Carex pseudocyperus</i> | |
| <i>Carex pseudocyperus</i> var. <i>americana</i> | <i>Carex pseudocyperus</i> var. <i>americana</i> |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|-----------------------------------|-------------------------------|
| Carex hystrixina..... | Carex hystrixina..... |
| Carex schweinitzii..... | Carex schweinitzii..... |
| Carex lurida..... | Carex lurida..... |
| Carex retrorsa..... | |
| Carex tuckermanni..... | |
| Carex monile..... | Carex monile..... |
| Carex utriculata..... | Carex utriculata..... |
| Carex oligosperma..... | |
| Carex lupulina..... | Carex lupulina..... |
| | Carex lupulina var. longiped- |
| Carex intumescens..... | unculata..... |
| Carex pauciflora..... | Carex intumescens..... |
| | |
| <i>Aroidae.</i> | |
| Acorus calamus..... | Acorus calamus..... |
| Spathyema foetida..... | |
| Calla palustris..... | |
| Arisaema triphyllum..... | Arisaema triphyllum..... |
| | |
| <i>Lemnaceae.</i> | |
| Lemna minor..... | Lemna minor..... |
| Lemna perpusilla..... | Lemna perpusilla..... |
| Lemna trisulca..... | Lemna trisulca..... |
| Lemna polyrhiza..... | Lemna polyrhiza..... |
| | Grantia columbiana..... |
| | Grantia brasiliensis..... |
| | |
| <i>Xyridaceae.</i> | |
| | Xyris flexuosa..... |
| | |
| <i>Eriocaulaceae.</i> | |
| Eriocaulon septangulare..... | |
| | |
| <i>Commelinaceae.</i> | |
| | Tradescantia virginica..... |
| | |
| <i>Pontederiaceae.</i> | |
| Pontederia cordata..... | Pontederia cordata..... |
| | Heteranthera dubia..... |
| | |
| <i>Juncaceae.</i> | |
| Juncus tenuis..... | Juncus tenuis..... |
| Juncus vaseyi..... | |
| Juncus balticus var. littoralis.. | |
| Juncus filiformis..... | |
| Juncus effusus..... | Juncus effusus..... |
| Juncus nodosus var. genuinus.. | |
| | Juncus nodosus var. mega- |
| Juncus canadensis var. coar- | cephalus..... |
| tatus..... | |

of Minnesota Valley Metaspermic Species.—*Continued.*

| EASTERN. | WESTERN. |
|--|--|
| <i>Carex hystrix</i> | |
| <i>Carex schweinitzii</i> | |
| <i>Carex lurida</i> | |
| <i>Carex retrorsa</i> | <i>Carex retrorsa</i> |
| <i>Carex tuckermanni</i> | |
| <i>Carex monile</i> | <i>Carex monile</i> |
| <i>Carex utriculata</i> | <i>Carex utriculata</i> |
| <i>Carex oligosperma</i> | <i>Carex oligosperma</i> |
| <i>Carex lupulina</i> | |
| <i>Carex lupulina</i> var. <i>longipedunculata</i> | |
| <i>Carex intumescens</i> | |
| <i>Carex pauciflora</i> | <i>Carex pauciflora</i> |
| <i>Aroidae.</i> | |
| <i>Acorus calamus</i> | |
| <i>Spathyema foetida</i> | |
| <i>Calla palustris</i> | |
| <i>Arisaema triphyllum</i> | |
| <i>Lemnaceae.</i> | |
| <i>Lemna minor</i> | <i>Lemna minor</i> |
| <i>Lemna perpusilla</i> | |
| <i>Lemna trisulca</i> | <i>Lemna trisulca</i> |
| <i>Lemna polyrhiza</i> | <i>Lemna polyrhiza</i> |
| <i>Grantia columbiana</i> | |
| <i>Grantia brasiliensis</i> | |
| <i>Xyridaceae.</i> | |
| <i>Xyris flexuosa</i> | |
| <i>Eriocaulaceae.</i> | |
| <i>Eriocaulon septangulare</i> | |
| <i>Commelinaceae.</i> | |
| <i>Tradescantia virginica</i> | |
| <i>Pontederiaceae.</i> | |
| <i>Pontederia cordata</i> | |
| <i>Heteranthera dubia</i> | <i>Heteranthera dubia</i> |
| <i>Juncaceae.</i> | |
| <i>Juncus tenuis</i> | <i>Juncus tenuis</i> |
| <i>Juncus vaseyi</i> | <i>Juncus vaseyi</i> |
| <i>Juncus balticus</i> var. <i>littoralis</i> | |
| <i>Juncus filiformis</i> | <i>Juncus filiformis</i> |
| <i>Juncus effusus</i> | <i>Juncus effusus</i> |
| <i>Juncus nodosus</i> var. <i>genuinus</i> | <i>Juncus nodosus</i> var. <i>genuinus</i> |
| <i>Juncus nodosus</i> var. <i>megacephalus</i> | <i>Juncus nodosus</i> var. <i>megacephalus</i> |
| <i>Juncus canadensis</i> var. <i>coarctatus</i> | |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|---|---|
| <i>Juncus canadensis</i> var. <i>longe-caudatus</i> | <i>Juncus canadensis</i> var. <i>longe-caudatus</i> |
| | <i>Juncus acuminatus</i> var. <i>legitimus</i> |
| <i>Cyperella campestris</i> var. <i>multiflora</i> | <i>Cyperella campestris</i> var. <i>multiflora</i> |
| <i>Liliaceae.</i> | |
| <i>Tofieldia glutinosa</i> | |
| <i>Zigadenus elegans</i> | <i>Zigadenus elegans</i> |
| | <i>Melanthium virginium</i> |
| <i>Veratrum viride</i> | |
| | <i>Uvularia grandiflora</i> |
| | <i>Uvularia perfoliata</i> |
| <i>Uvularia sessilifolia</i> | <i>Uvularia sessilifolia</i> |
| | <i>Allium canadense</i> |
| <i>Allium stellatum</i> | <i>Allium stellatum</i> |
| <i>Allium cernuum</i> | |
| <i>Allium schoenoprasum</i> | |
| <i>Allium tricoccum</i> | <i>Allium tricoccum</i> |
| | <i>Lilium canadense</i> |
| | <i>Lilium superbum</i> |
| <i>Lilium philadelphicum</i> | <i>Lilium philadelphicum</i> |
| <i>Erythronium albidum</i> | <i>Erythronium albidum</i> |
| | <i>Erythronium americanum</i> |
| | <i>Camassia fraseri</i> |
| <i>Clintonia borealis</i> | |
| <i>Unifolium bifolium</i> | |
| <i>Unifolium trifolium</i> | |
| <i>Unifolium stellatum</i> | |
| | <i>Unifolium racemosum</i> |
| | <i>Polygonatum commutatum</i> ... |
| | <i>Polygonatum biflorum</i> |
| | <i>Medeola virginica</i> |
| | <i>Trillium nivale</i> |
| <i>Trillium cernuum</i> | <i>Trillium cernuum</i> |
| <i>Trillium grandiflorum</i> | <i>Trillium grandiflorum</i> |
| <i>Trillium erectum</i> | <i>Trillium erectum</i> |
| | <i>Trillium recurvatum</i> |
| | <i>Trillium sessile</i> |
| | <i>Smilax hispida</i> |
| | <i>Smilax rotundifolia</i> |
| | <i>Smilax echinrata</i> |
| | <i>Smilax herbacea</i> |
| <i>Amaryllidaceae.</i> | |
| | <i>Hypoxis erecta</i> |

of Minnesota Valley Metaspermic Species.—*Continued.*

| EASTERN. | WESTERN. |
|---|--|
| <i>Juncus canadensis</i> var. <i>longe-caudatus</i> | |
| <i>Juncus acuminatus</i> var. <i>legitimus</i> | |
| <i>Cyperella campestris</i> var. <i>multiflora</i> | <i>Cyperella campestris</i> var. <i>multiflora</i> |
| <i>Liliaceae.</i> | |
| <i>Tofieldia glutinosa</i> | <i>Tofieldia glutinosa</i> |
| <i>Zigadenus elegans</i> | <i>Zigadenus elegans</i> |
| <i>Melanthium virginicum</i> | |
| <i>Veratrum viride</i> | <i>Veratrum viride</i> |
| <i>Uvularia grandiflora</i> | |
| <i>Uvularia perfoliata</i> | |
| <i>Uvularia sessilifolia</i> | |
| <i>Allium canadense</i> | |
| | <i>Allium stellatum</i> |
| <i>Allium cernuum</i> | <i>Allium cernuum</i> |
| <i>Allium schoenoprasum</i> | <i>Allium schoenoprasum</i> |
| <i>Allium tricoccum</i> | |
| <i>Lilium canadense</i> | |
| <i>Lilium superbum</i> | |
| <i>Lilium philadelphicum</i> | <i>Lilium philadelphicum</i> |
| <i>Erythronium albidum</i> | |
| <i>Erythronium americanum</i> | |
| <i>Camassia fraseri</i> | |
| <i>Clintonia borealis</i> | <i>Clintonia borealis</i> |
| <i>Unifolium bifolium</i> | <i>Unifolium bifolium</i> |
| <i>Unifolium trifolium</i> | <i>Unifolium trifolium</i> |
| <i>Unifolium stellatum</i> | <i>Unifolium stellatum</i> |
| <i>Unifolium racemosum</i> | |
| <i>Polygonatum commutatum</i> | |
| <i>Polygonatum biflorum</i> | |
| <i>Medeola virginica</i> | |
| <i>Trillium nivale</i> | |
| <i>Trillium cernuum</i> | |
| <i>Trillium grandiflorum</i> | |
| <i>Trillium erectum</i> | |
| <i>Trillium recurvatum</i> | |
| <i>Trillium sessile</i> | |
| <i>Smilax hispida</i> | |
| <i>Smilax rotundifolia</i> | |
| <i>Smilax echinarrata</i> | |
| <i>Smilax herbacea</i> | |
| <i>Amaryllidaceae.</i> | |
| <i>Hypoxis erecta</i> | |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|--------------------------------|-------------------------------|
| | <i>Dioscoreaceae.</i> |
| | Dioscorea villosa..... |
| | <i>Iridaceae.</i> |
| | Iris versicolor..... |
| Sisyrinchium mucronatum..... | Sisyrinchium mucronatum..... |
| Sisyrinchium angustifolium.... | Sisyrinchium angustifolium .. |
| | <i>Orchidaceae.</i> |
| Cypripedium acaule..... | |
| Cypripedium spectabile..... | Cypripedium spectabile..... |
| Cypripedium pubescens..... | Cypripedium pubescens..... |
| Cypripedium parviflorum..... | |
| Cypripedium candidum..... | Cypripedium candidum..... |
| Cypripedium arietinum | |
| Orchis spectabilis..... | Orchis spectabilis..... |
| Habenaria psycodes..... | Habenaria psycodes..... |
| Habenaria lacera..... | Habenaria lacera |
| Habenaria leucophaea..... | Habenaria leucophaea..... |
| Habenaria hookeriana..... | |
| Habenaria dilatata | |
| Habenaria hyperborea..... | |
| Habenaria bracteata..... | |
| Habenaria flava..... | Habenaria flava..... |
| Habenaria tridentata..... | Habenaria tridentata..... |
| Pogonia ophioglossoides..... | Pogonia ophioglossoides |
| Arethusa bulbosa..... | |
| Gyrostachys gracilis..... | |
| Gyrostachys cernua..... | Gyrostachys cernua..... |
| Gyrostachys romanzowiana.... | |
| Peranium pubescens..... | Peranium pubescens..... |
| Peranium repens..... | |
| Achroanthos unifolia..... | Achroanthos unifolia..... |
| Leptorchis loeselii..... | |
| | Leptorchis liliifolia..... |
| Corallorhiza multiflora..... | |
| Corallorhiza corallorhiza..... | |
| Cathea tuberosa | Cathea tuberosa..... |
| Aplectrum spicatum..... | Aplectrum spicatum..... |
| | <i>Juglandaceae.</i> |
| | Juglans nigra..... |
| Juglans cinerea..... | Juglans cinerea..... |
| | Scoria minima..... |
| | Scoria ovata..... |
| | <i>Myricaceae</i> |
| Myrica asplenifolia | Myrica asplenifolia..... |
| | <i>Salicaceae</i> |
| Populus monilifera..... | Populus monilifera..... |

of Minnesota Valley Metaspermic Species.—*Continued.*

| EASTERN. | WESTERN. |
|---------------------------------|--------------------------------|
| <i>Dioscoreaceae.</i> | |
| Dioscorea villosa..... | |
| <i>Iridaceae.</i> | |
| Iris versicolor..... | |
| Sisyrinchium mucronatum..... | |
| Sisyrinchium angustifolium..... | |
| <i>Orchidaceae.</i> | |
| Cypripedium acaule..... | Cypripedium acaule..... |
| Cypripedium spectabile..... | |
| Cypripedium pubescens..... | Cypripedium pubescens..... |
| Cypripedium parviflorum..... | Cypripedium parviflorum..... |
| Cypripedium candidum..... | Cypripedium candidum..... |
| Cypripedium arietinum..... | |
| Orchis spectabilis..... | |
| Habenaria psycodes..... | |
| Habenaria lacera..... | |
| Habenaria leucophaea..... | |
| Habenaria hookeriana..... | |
| Habenaria dilatata..... | Habenaria dilatata..... |
| Habenaria hyperborea..... | Habenaria hyperborea..... |
| Habenaria bracteata..... | Habenaria bracteata..... |
| Habenaria flava..... | |
| Habenaria tridentata..... | |
| Pogonia ophioglossoides..... | |
| Arethusa bulbosa..... | |
| Gyrostachys gracilis..... | Gyrostachys gracilis..... |
| Gyrostachys cernua..... | |
| Gyrostachys romanzowiana..... | Gyrostachys romanzowiana... |
| Peramium pubescens..... | |
| Peramium repens..... | Peramium repens..... |
| Achroanthos unifolia..... | |
| Leptorchis loeselii..... | |
| Leptorchis liliifolia..... | |
| Corallorhiza multiflora..... | Corallorhiza multiflora..... |
| Corallorhiza corallorhiza..... | Corollorhiza corallorhiza..... |
| Cathea tuberosa..... | |
| Aplectrum spicatum..... | Aplectrum spicatum,..... |
| <i>Juglandaceae.</i> | |
| Juglans nigra..... | |
| Juglans cinerea..... | |
| Scoria minima..... | |
| Scoria ovata..... | |
| <i>Myricaceae.</i> | |
| Myrica asplenifolia..... | |
| <i>Salicaceae.</i> | |
| Populus monilifera..... | Populus monilifera..... |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|---------------------------------|---------------------------------|
| Populus balsamifera | Populus grandidentata |
| Populus grandidentata | Populus grandidentata |
| Populus tremuloides | |
| Salix myrtilloides | |
| Salix cordata | |
| Salix cordata var. angustata .. | Salix cordata var. angustata .. |
| Salix candida | |
| Salix petiolaris | |
| Salix tristis | Salix tristis |
| Salix humilis | Salix humilis |
| Salix discolor | Salix discolor |
| Salix rostrata | |
| Salix longifolia | |
| Salix lucida | |
| Salix amygdaloides | Salix amygdaloides |
| Salix nigra | Salix nigra |
| <i>Betulaceae.</i> | |
| | Carpinus caroliniana |
| | Ostrya ostrya |
| Corylus rostrata | |
| Corylus americana | Corylus americana |
| Betula pumila | |
| | Betula nigra |
| Betula papyrifera | |
| Alnus incana | |
| <i>Fagaceae.</i> | |
| | Quercus velutina |
| | Quercus rubra |
| | Quercus muhlenbergii |
| Quercus macrocarpa | Quercus macrocarpa |
| | Quercus alba |
| <i>Ulmaceae.</i> | |
| Ulmus racemosa | Ulmus racemosa |
| | Ulmus americana |
| | Ulmus fulva |
| | Celtis occidentalis |
| <i>Moraceae.</i> | |
| | Morus rubra |
| Humulus lupulus | Humulus lupulus |
| <i>Urticaceae.</i> | |
| Urtica gracilis | |
| | Laportea canadensis |
| | Adicea pumila |
| | Ramium cylindricum |
| Parietaria pennsylvanica | Parietaria pennsylvanica |

of Minnesota Valley Metaspermic Species.—*Continued.*

| EASTERN. | WESTERN. |
|---------------------------------|--------------------------|
| Populus balsamifera..... | Populus balsamifera..... |
| Populus grandidentata..... | |
| Populus tremuloides..... | Populus tremuloides..... |
| Salix myrtilloides..... | Salix myrtilloides..... |
| Salix cordata..... | Salix cordata..... |
| Salix cordata var. angustata... | |
| Salix candida..... | |
| Salix petiolaris..... | Salix petiolaris..... |
| Salix tristis..... | |
| Salix humilis..... | |
| Salix discolor..... | |
| Salix rostrata..... | Salix rostrata..... |
| Salix longifolia..... | Salix longifolia..... |
| Salix lucida..... | Salix lucida..... |
| | Salix amygdaloides..... |
| Salix nigra..... | Salix nigra..... |
| <i>Betulaceae.</i> | |
| Carpinus caroliniana..... | |
| Ostrya ostrya..... | |
| Corylus rostrata..... | Corylus rostrata..... |
| Corylus americana..... | |
| Betula pumila..... | |
| Betula nigra..... | |
| Betula papyrifera..... | Betula papyrifera..... |
| Alnus incana..... | Alnus incana..... |
| <i>Fagaceae.</i> | |
| Quercus velutina..... | |
| Quercus rubra..... | |
| Quercus muhlenbergii..... | |
| Quercus macrocarpa..... | |
| Quercus alba..... | |
| <i>Ulmaceae.</i> | |
| Ulmus racemosa..... | |
| Ulmus americana..... | |
| Ulmus fulva..... | |
| Celtis occidentalis..... | Celtis occidentalis..... |
| <i>Moraceae.</i> | |
| Morus rubra..... | |
| Humulus lupulus..... | Humulus lupulus..... |
| <i>Urticaceae.</i> | |
| Urtica gracilis..... | Urtica gracilis..... |
| Laportea canadensis..... | |
| Adicea pumila..... | |
| Ramium cylindricum..... | |
| Parietaria pennsylvanica..... | |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|--------------------------------|------------------------------|
| | <i>Santalaceae.</i> |
| Comandra livida..... | |
| Comandra umbellata..... | |
| Comandra pallida..... | |
| | <i>Aristolochiaceae.</i> |
| Asarum canadense..... | |
| | Aristolochia siphon..... |
| | <i>Polygonaceae.</i> |
| | Rumex verticillatus..... |
| | Rumex altissimus..... |
| Rumex britannicus..... | Rumex britannicus..... |
| Rumex salicifolius..... | |
| Rumex persicarioides..... | Rumex persicarioides..... |
| | Polygonum acre..... |
| Polygonum hydropiper..... | |
| | Polygonum hydropiperoides.. |
| Polygonum hartwrightii..... | Polygonum hartwrightii..... |
| | Polygonum emersum..... |
| Polygonum amphibium..... | Polygonum amphibium..... |
| | Polygonum pennsylvanicum.. |
| Polygonum incarnatum..... | Polygonum incarnatum..... |
| Polygonum tenue..... | Polygonum tenue..... |
| Polygonum ramosissimum..... | Polygonum ramosissimum.... |
| | Polygonum erectum..... |
| Polygonum aviculare..... | Polygonum aviculare..... |
| | Polygonum virginianum..... |
| Polygonum articulatum..... | Polygonum articulatum..... |
| | Polygonum scandens..... |
| Polygonum cilinode..... | |
| Polygonum arifolium..... | Polygonum arifolium..... |
| | Polygonum sagittatum..... |
| | <i>Chenopodiaceae.</i> |
| Chenopodium rubrum..... | |
| | Chenopodium boscianum..... |
| Chenopodium capitatum..... | Chenopodium capitatum..... |
| Corispermum hyssopifolium..... | |
| Salsola kali..... | Salsola kali..... |
| | <i>Amarantaceae.</i> |
| | Amaranthus tataricus..... |
| | Amaranthus retrofractus..... |
| | Amaranthus blitoides..... |
| | <i>Phytolaccaceae.</i> |
| | Phytolacca decandra..... |
| | <i>Nyctaginaceae.</i> |
| | Mirabilis angustifolius..... |

of Minnesota Valley Metaspermic Species.—Continued.

| EASTERN. | WESTERN. |
|--------------------------------|------------------------------|
| <i>Santalaceae.</i> | |
| Comandra livida..... | Comandra livida..... |
| Comandra umbellata..... | Comandra umbellata..... |
| | Comandra pallida..... |
| <i>Aristolochiaceae.</i> | |
| Asarum canadense..... | |
| Aristolochia sipho..... | |
| <i>Polygonaceae.</i> | |
| Rumex verticillatus..... | |
| Rumex altissimus..... | Rumex altissimus..... |
| Rumex britannicus..... | Rumex britannicus..... |
| Rumex salicifolius..... | Rumex salicifolius..... |
| Rumex persicarioides..... | Rumex persicarioides..... |
| Polygonum acre..... | |
| Polygonum hydropiper..... | Polygonum hydropiper..... |
| Polygonum hydropiperoides..... | |
| Polygonum hartwrightii..... | Polygonum hartwrightii..... |
| Polygonum emersum..... | Polygonum emersum..... |
| Polygonum amphibium..... | Polygonum amphibium..... |
| Polygonum pennsylvanicum..... | Polygonum pennsylvanicum.. |
| Polygonum incarnatum..... | Polygonum incarnatum..... |
| Polygonum tenue..... | Polygonum tenue..... |
| Polygonum ramosissimum..... | Polygonum ramosissimum.... |
| Polygonum erectum..... | Polygonum erectum..... |
| Polygonum aviculare..... | |
| Polygonum virginianum..... | |
| Polygonum articulatum..... | |
| Polygonum scandens..... | Polygonum scandens..... |
| Polygonum cilinode..... | |
| Polygonum arifolium..... | |
| Polygonum sagittatum..... | |
| <i>Chenopodiaceae.</i> | |
| Chenopodium rubrum..... | Chenopodium rubrum..... |
| Chenopodium boscianum..... | |
| Chenopodium capitatum..... | Chenopodium capitatum..... |
| Corispermum hyssopifolium... | Corispermum hyssopifolium.. |
| Salsola kali..... | |
| <i>Amarantaceae.</i> | |
| Acnide tamariscina..... | |
| Froelichia floridana..... | |
| | Amarantus blitoides..... |
| <i>Phytolaccaceae.</i> | |
| Phytolacca decandra..... | |
| <i>Nyctaginaceae.</i> | |
| | Mirabilis angustifolius..... |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|---|-------------------------------|
| | Mirabilis hirsutus..... |
| | Mirabilis nyctagineus. |
| | <i>Portulaca</i> caceae. |
| | Talinum teretifolium..... |
| Claytonia virginica..... | |
| | Portulaca retusa..... |
| | <i>Caryoph</i> yllaceae. |
| | Silene antirrhina..... |
| | Silene virginica..... |
| | Silene alba..... |
| | Silene stellata |
| Stellularia crassifolia..... | |
| Stellularia longipes..... | |
| Stellularia longifolia..... | |
| Cerastium arvense..... | |
| Cerastium arvense var. bracteatum | |
| Cerastium nutans..... | Cerastium nutans..... |
| Moehringia lateriflora..... | |
| | Anychia dichotoma..... |
| | <i>Nympha</i> eaceae. |
| | Nelumbo nelumbo..... |
| | Brasenia peltata..... |
| Leuconymphaea reniformis.... | Leuconymphaea reniformis.. |
| | Leuconymphaea ordorata..... |
| Nymphaea advena | Nymphaea advena..... |
| | <i>Ceratoph</i> yllaceae. |
| | Ceratophyllum demersum.... |
| | <i>Ranuncu</i> laceae. |
| | Hydrastis canadensis..... |
| Caltha palustris..... | |
| Isopyrum trifolium..... | |
| | Isopyrum biternatum..... |
| Actaea alba | |
| Actaea rubra | |
| | Aquilegia canadensis..... |
| | Delphinium carolinianum.... |
| | Delphinium tricorne..... |
| | Delphinium exaltatum..... |
| | Anemone thalictroides..... |
| Anemone hepatica | Anemone hepatica |
| Anemone hepatica var. acuta.. | Anemone hepatica var. acuta.. |
| Anemone quinquefolia..... | |
| Anemone dichotoma var. canadensis | |

of Minnesota Valley Metaspermic Species.—*Continued.*

| EASTERN. | WESTERN. |
|---|--|
| | Mirabilis hirsutus..... |
| | Mirabilis nyctagineus..... |
| | <i>Portulaca</i> caceae. |
| Talinum teretifolium | Talinum teretifolium..... |
| Claytonia virginica..... | Claytonia virginica..... |
| | Portulaca retusa..... |
| | <i>Caryophyll</i> aceae. |
| Silene antirrhina..... | Silene antirrhina..... |
| Silene virginica..... | Silene virginica..... |
| Silene alba..... | |
| Silene stellata | Silene stellata..... |
| Stellularia crassifolia..... | Stellularia crassifolia..... |
| Stellularia longipes..... | Stellularia longipes..... |
| Stellularia longifolia..... | Stellularia longifolia..... |
| Cerastium arvense | Cerastium arvense..... |
| Cerastium arvense var. bracteatum. | |
| Cerastium nutans..... | Cerastium nutans |
| Moehringia lateriflora..... | Moehringia lateriflora..... |
| Anychia dichotoma..... | |
| | <i>Nymphaea</i> eaceae. |
| Nelumbo nelumbo..... | |
| Brasenia peltata..... | Brasenia peltata..... |
| Leuconymphaea reniformis.... | |
| Leuconymphaea ordorata..... | |
| Nymphaea advena..... | Nymphaea advena..... |
| | <i>Ceratophyll</i> aceae. |
| Ceratophyllum demersum..... | Ceratophyllum demersum.... |
| | <i>Ranunc</i> ulaceae. |
| Hydrastis canadensis..... | |
| Caltha palustris..... | Caltha palustris..... |
| Isopyrum trifolium..... | Isopyrum trifolium..... |
| Isopyrum bitermum..... | |
| Actaea alba..... | Actaea alba..... |
| Actaea rubra..... | Actaea rubra..... |
| Aquilegia canadensis..... | Aquilegia canadensis..... |
| Delphinium carolinianum..... | |
| Delphinium tricornis..... | |
| Delphinium exaltatum..... | |
| Anemone thalictroides | |
| Anemone hepatica..... | |
| Anemone hepatica var. acuta.. | |
| Anemone quinquefolia..... | Anemone quinquefolia..... |
| Anemone dichotoma var. canadensis..... | Anemone dichotoma var. canadensis..... |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|---|---|
| Anemone virginiana..... | |
| Anemone cylindrica..... | |
| Anemone multifida..... | |
| Anemone parviflora..... | |
| | Anemone caroliniana..... |
| Anemone hirsutissima..... | |
| | Clematis virginiana..... |
| Oxygraphis cymbalaria..... | |
| Ranunculus pennsylvanicus..... | |
| Ranunculus repens..... | |
| Ranunculus septentrionalis.... | Ranunculus septentrionalis... |
| | Ranunculus fascicularis..... |
| Ranunculus recurvatus..... | Ranunculus recurvatus..... |
| Ranunculus sceleratus..... | Ranunculus sceleratus..... |
| Ranunculus abortivus..... | Ranunculus abortivus..... |
| Ranunculus abortivus var. mi- cranthus..... | |
| Ranunculus ovalis..... | |
| Ranunculus pedatifidus..... | |
| Ranunculus reptans..... | |
| Ranunculus ambigens..... | Ranunculus ambigens..... |
| Ranunculus lacustris..... | |
| Ranunculus lacustris var. ter- restris..... | |
| Ranunculus aquatilis var. tri- chophyllus..... | Ranunculus aquatilis var. tri- chophyllus..... |
| Ranunculus aquatilis var. caes- pitosus..... | |
| Ranunculus circinnatus..... | |
| Thalictrum purpurascens..... | Thalictrum purpurascens..... |
| Thalictrum dioicum..... | |
| | <i>Berberidaceae</i> |
| | Podophyllum peltatum..... |
| Leontice thalictroides..... | Leontice thalictroides..... |
| | <i>Menispermaceae.</i> |
| Menispermum canadense..... | Menispermum canadense..... |
| | <i>Papaveraceae.</i> |
| Sanguinaria canadensis..... | Sanguinaria canadensis..... |
| Capnorchis cucullaria..... | |
| Capnorchis canadensis..... | |
| Neckeria aurea..... | Neckeria aurea..... |
| | Neckeria micrantha..... |
| | Neckeria flavula..... |
| Neckeria sempervirens..... | |

of Minnesota Valley Metaspermic Species.—*Continued.*

| EASTERN. | WESTERN. |
|---------------------------------|---------------------------------|
| Anemone virginiana..... | Anemone virginiana..... |
| Anemone cylindrica..... | Anemone cylindrica..... |
| Anemone multifida..... | Anemone multifida..... |
| | Anemone parviflora..... |
| Anemone caroliniana..... | |
| Anemone hirsutissima..... | |
| Clematis virginiana..... | |
| Oxygraphis cymbalaria..... | Oxygraphis cymbalaria..... |
| Ranunculus pennsylvanicus.... | Ranunculus pennsylvanicus... |
| | Ranunculus repens..... |
| Ranunculus septentrionalis.... | Ranunculus septentrionalis... |
| Ranunculus fascicularis..... | |
| Ranunculus recurvatus..... | |
| Ranunculus sceleratus..... | Ranunculus sceleratus..... |
| Ranunculus abortivus..... | Ranunculus abortivus..... |
| Ranunculus abortivus var. mi- | Ranunculus abortivus var. mi- |
| cranthus..... | cranthus..... |
| Ranunculus ovalis..... | Ranunculus ovalis..... |
| Ranunculus pedatifidus..... | Ranunculus pedatifidus..... |
| Ranunculus reptans..... | Ranunculus reptans..... |
| Ranunculus ambigens..... | Ranunculus ambigens..... |
| Ranunculus lacustris..... | Ranunculus lacustris..... |
| Ranunculus lacustris var. ter- | Ranunculus lacustris var. ter- |
| restris..... | restris..... |
| Ranunculus aquatilis var. tri- | Ranunculus aquatilis var. tri- |
| chophyllus..... | chophyllus..... |
| Ranunculus aquatilis var. caes- | Ranunculus aquatilis var. caes- |
| pitous..... | pitous..... |
| Ranunculus circinnatus..... | Ranunculus circinnatus..... |
| Thalictrum purpurascens..... | |
| Thalictrum dioicum..... | Thalictrum dioicum..... |
| <i>Berberidaceae.</i> | |
| Podophyllum peltatum..... | |
| Leontice thalictroides..... | |
| <i>Menispermaceae.</i> | |
| Menispermum canadense..... | |
| <i>Papaveraceae.</i> | |
| Sanguinaria canadensis..... | |
| Capnorchis cucullaria..... | |
| Capnorchis canadensis..... | |
| Neckeria aurea..... | Neckeria aurea..... |
| Neckeria micrantha..... | Neckeria micrantha..... |
| Neckeria flavula..... | |
| Neckeria sempervirens..... | Neckeria sempervirens..... |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|---|--------------------------------------|
| <i>Cruciferae.</i> | |
| | <i>Thelypodium pinnatifidum</i> |
| | <i>Lepidium virginicum</i> |
| <i>Lepidium intermedium</i> | <i>Lepidium intermedium</i> |
| <i>Sisymbrium hartwegianum</i> | <i>Sisymbrium hartwegianum</i> ... |
| <i>Sisymbrium multifidum</i> | |
| <i>Barbarea barbarea</i> var. <i>stricta</i> | |
| <i>Nasturtium hispidum</i> | <i>Nasturtium hispidum</i> |
| <i>Nasturtium palustre</i> | <i>Nasturtium palustre</i> |
| | <i>Nasturtium sinuatum</i> |
| <i>Cardamine parviflora</i> | <i>Cardamine parviflora</i> |
| <i>Cardamine hirsuta</i> | <i>Cardamine hirsuta</i> |
| | <i>Cardamine bulbosa</i> |
| | <i>Cardamine laciniata</i> |
| <i>Cardamine diphylla</i> | <i>Cardamine diphylla</i> |
| <i>Lesquerella argentea</i> | <i>Lesquerella argentea</i> |
| <i>Draba nemorosa</i> | |
| | <i>Draba caroliniana</i> |
| | <i>Draba micrantha</i> |
| | <i>Draba verna</i> |
| | <i>Arabis dentata</i> |
| <i>Arabis lyrata</i> | |
| <i>Arabis confinis</i> | <i>Arabis confinis</i> |
| <i>Arabis glabra</i> | |
| | <i>Arabis canadensis</i> |
| <i>Arabis laevigata</i> | <i>Arabis laevigata</i> |
| <i>Arabis hirsuta</i> | |
| | <i>Arabis patens</i> |
| <i>Erysimum inconspicuum</i> | |
| | <i>Erysimum asperum</i> |
| <i>Erysimum cheiranthoides</i> | <i>Erysimum cheiranthoides</i> |
| <i>Capparidaceae.</i> | |
| | <i>Cleome serrulata</i> |
| | <i>Jacksonia dodecandra</i> |
| <i>Sarraceniacae.</i> | |
| <i>Sarracenia purpurea</i> | |
| <i>Droseraceae.</i> | |
| <i>Drosera linearis</i> | |
| <i>Drosera intermedia</i> var. <i>americana</i> | |
| <i>Drosera rotundifolia</i> | |
| <i>Crassulaceae.</i> | |
| | <i>Penthorum sedoides</i> |
| <i>Saxifragaceae.</i> | |
| <i>Saxifraga pennsylvanica</i> | |

of Minnesota Valley Metaspermic Species.—*Continued.*

| EASTERN. | WESTERN. |
|--|------------------------------------|
| <i>Cruciferae.</i> | |
| Thelypodium pinnatifidum..... | Lepidium virginicum..... |
| Lepidium virginicum..... | Lepidium intermedium..... |
| Lepidium intermedium..... | Sisymbrium hartwegianum... |
| Sisymbrium multifidum..... | Sisymbrium multifidum..... |
| Nasturtium hispidum..... | Barbarea barbarea var. stricta |
| Nasturtium palustre..... | Nasturtium hispidum..... |
| Cardamine parviflora..... | Nasturtium palustre..... |
| Cardamine hirsuta..... | Nasturtium sinuatum..... |
| Cardamine bulbosa..... | Cardamine parviflora..... |
| Cardamine laciniata..... | Cardamine hirsuta..... |
| Cardamine diphylla..... | Lesquerella argentea..... |
| Draba caroliniana..... | Draba nemorosa..... |
| Draba verna..... | Draba micrantha..... |
| Arabis dentata..... | Arabis lyrata..... |
| Arabis lyrata..... | Arabis confinis..... |
| Arabis confinis..... | Arabis glabra..... |
| Arabis canadensis..... | Arabis hirsuta..... |
| Arabis laevigata..... | Erysimum inconspicuum..... |
| Arabis hirsuta..... | Erysimum asperum..... |
| Arabis patens..... | Erysimum cheiranthoides..... |
| Erysimum cheiranthoides..... | <i>Cappariaceae.</i> |
| Cleome serrulata..... | Cleome serrulata..... |
| Jacksonia dodecandra..... | Jacksonia dodecandra..... |
| Sarracenia purpurea..... | <i>Sarraceniaceae.</i> |
| Sarracenia purpurea..... | Sarracenia purpurea..... |
| <i>Droseraceae.</i> | <i>Droseraceae.</i> |
| Drosera intermedia var. americana..... | Drosera linearis..... |
| Drosera rotundifolia..... | Drosera intermedia var. americana. |
| Penthorum sedoides..... | Drosera rotundifolia..... |
| Saxifraga pennsylvanica..... | <i>Crassulaceae.</i> |
| | <i>Saxifragaceae.</i> |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|---------------------------------|---------------------------------|
| Tiarella cordifolia..... | Tiarella cordifolia..... |
| Heuchera hispida..... | Heuchera hispida..... |
| | Heuchera americana..... |
| Mitella nuda..... | |
| Mitella diphylla..... | Mitella diphylla..... |
| Chrysosplenium americanum.. | Chrysosplenium americanum.. |
| | Parnassia caroliniana..... |
| Parnassia palustris..... | |
| Ribes rubrum var. albinervium | |
| Ribes floridum..... | Ribes floridum..... |
| Ribes oxycanthoides..... | |
| | Ribes gracile..... |
| | Ribes cynobasti..... |
| | <i>Rosa</i> <i>ceae</i> . |
| Opulaster opulifolius..... | Opulaster opulifolius..... |
| Spiraea tomentosa..... | Spiraea tomentosa..... |
| Spiraea salicifolia..... | |
| Pirus sambucifolia..... | |
| | Pirus arbutifolia..... |
| | Pirus coronaria..... |
| Amelanchier alnifolia..... | |
| | Amelanchier canadensis..... |
| Amelanchier canadensis var. | Amelanchier canadensis var. |
| obovalis..... | obovalis..... |
| | Crataegus crus-galli..... |
| | Crataegus coccinea..... |
| | Crataegus mollis..... |
| | Crataegus tomentosa..... |
| Rubus repens..... | |
| Rubus hispidus..... | Rubus hispidus..... |
| Rubus canadensis..... | |
| Rubus villosus..... | Rubus villosus..... |
| Rubus occidentalis..... | |
| Rubus strigosus..... | |
| Rubus triflorus..... | |
| Fragaria vesca..... | |
| Fragaria virginiana var. illi- | Fragaria virginiana var. illi- |
| noensis..... | noensis..... |
| Potentilla canadensis..... | Potentilla canadensis..... |
| Potentilla canadensis var. sim- | Potentilla canadensis var. sim- |
| plex..... | plex..... |
| Potentilla anserina..... | |
| Potentilla tridentata..... | |
| Potentilla fruticosa..... | |
| Potentilla palustris..... | |

of Minnesota Valley Metaspermic Species.—*Continued.*

| EASTERN. | WESTERN. |
|--------------------------------|--------------------------------|
| Tiarella cordifolia..... | Heuchera hispida..... |
| Heuchera hispida..... | Heuchera hispida..... |
| Heuchera americana..... | Mitella nuda..... |
| Mitella nuda..... | Mitella diphylla..... |
| Mitella diphylla..... | Mitella diphylla..... |
| Chrysosplenium americanum... | |
| Parnassia caroliniana..... | |
| Parnassia palustris..... | Parnassia palustris..... |
| Ribes rubrum var. albinervium | Ribes rubrum var. albinervium |
| Ribes floridum..... | |
| Ribes oxycanthoides..... | Ribes oxycanthoides..... |
| Ribes gracile..... | Ribes gracile..... |
| Ribes cynobasti..... | Ribes cynobasti..... |
| <i>Rosa</i> <i>ceae.</i> | |
| Opulaster opulifolius..... | Opulaster opulifolius..... |
| Spiraea tomentosa..... | |
| Spiraea salicifolia..... | Spiraea salicifolia..... |
| Pirus sambucifolia..... | Pirus sambucifolia..... |
| Pirus arbutifolia..... | |
| Pirus coronaria..... | |
| | Amelanchier alnifolia..... |
| Amelanchier canadensis..... | |
| Amelanchier canadensis var. | Amelanchier canadensis var. |
| obovalis..... | obovalis..... |
| Crataegus crus-galli..... | |
| Crataegus coccinea..... | |
| Crataegus mollis..... | |
| Crataegus tomentosa..... | |
| Rubus repens..... | |
| Rubus hispidus..... | |
| Rubus canadensis..... | |
| Rubus villosus..... | |
| Rubus occidentalis..... | Rubus occidentalis..... |
| Rubus strigosus..... | Rubus strigosus..... |
| Rubus triflorus..... | Rubus triflorus..... |
| Fragaria vesca..... | Fragaria vesca..... |
| Fragaria virginiana var. illi- | Fragaria virginiana var. illi- |
| noensis..... | noensis..... |
| Potentilla canadensis..... | |
| Potentilla canadensis var. sim | |
| plex..... | |
| Potentilla anserina..... | Potentilla anserina..... |
| Potentilla tridentata..... | Potentilla tridentata..... |
| Potentilla fruticosa..... | Potentilla fruticosa..... |
| Potentilla palustris..... | Potentilla palustris..... |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|--|---|
| Potentilla argentea..... | Potentilla argentea..... |
| Potentilla pennsylvanica..... | |
| Potentilla pennsylvanica var. strigosa..... | |
| | Potentilla supina..... |
| Potentilla millegrana..... | Potentilla millegrana..... |
| Potentilla norvegica..... | Potentilla norvegica..... |
| Potentilla arguta..... | Potentilla arguta..... |
| Geum ciliatum..... | |
| Geum rivale..... | Geum rivale..... |
| Geum strictum..... | |
| Geum japonicum..... | |
| Geum virginianum..... | Geum virginianum..... |
| | Geum album..... |
| Agrimonia eupatoria..... | Agrimonia eupatoria..... |
| Rosa humilis..... | Rosa humilis..... |
| | Rosa carolina..... |
| Rosa pisocarpa..... | Rosa pisocarpa..... |
| Rosa acicularis..... | |
| Rosa virginiana..... | |
| | Rosa virginiana var. arkansana..... |
| | Prunus americana..... |
| Cerasus pumila..... | Cerasus pumila..... |
| | Cerasus serotina..... |
| Cerasus virginiana..... | Cerasus virginiana..... |
| Cerasus pennsylvanica..... | |
| | <i>Leguminosae.</i> |
| | Acuania illinoensis..... |
| | Cassia chamaecrista..... |
| | Gymnocladus dioicus..... |
| | Baptisia leucophaea..... |
| | Baptisia leucantha..... |
| | Baptisia tinctoria..... |
| | Falcata comosa..... |
| | Phaseolus pauciflorus..... |
| | Phaseolus angulosus..... |
| | Phaseolus polystachyos..... |
| Lathyrus palustris..... | Lathyrus palustris..... |
| Lathyrus palustris var. myrti- folius..... | Lathyrus palustris var. myrti- folius..... |
| Lathyrus glaucifolius..... | |
| Lathyrus venosus..... | Lathyrus venosus..... |
| | Apios apios..... |
| Vicia americana..... | Vicia americana..... |
| | Vicia caroliniana..... |

of Minnesota Valley Metaspermic Species.—*Continued.*

| EASTERN. | WESTERN. |
|-------------------------------|--------------------------------|
| Potentilla argentea..... | |
| Potentilla pennsylvanica..... | Potentilla pennsylvanica..... |
| | Potentilla pennsylvanica var. |
| | strigosa..... |
| Potentilla supina..... | |
| | Potentilla millegrana..... |
| Potentilla norvegica..... | |
| Potentilla arguta..... | Potentilla arguta..... |
| Geum ciliatum..... | Geum ciliatum..... |
| Geum rivale..... | |
| Geum strictum..... | Geum strictum..... |
| Geum japonicum..... | Geum japonicum..... |
| Geum virginianum..... | |
| Geum album..... | |
| Agrimonia eupatoria..... | Agrimonia eupatoria..... |
| Rosa humilis..... | |
| Rosa carolina..... | |
| | Rosa pisocarpa..... |
| | Rosa acicularis..... |
| Rosa virginiana..... | Rosa virginiana..... |
| | Rosa virginiana var. arkansana |
| Prunus americana..... | |
| Cerasus pumila..... | |
| Cerasus serotina..... | |
| Cerasus virginiana..... | Cerasus virginiana..... |
| Cerasus pennsylvanica..... | Cerasus pennsylvanica..... |
| | <i>Legum inosae.</i> |
| Acuania illinoensis..... | |
| Cassia chamaecrista..... | |
| Gymnocladus dioicus..... | |
| Baptisia leucophaea..... | |
| Baptisia leucantha..... | |
| Baptisia tinctoria..... | |
| Falcata comosa..... | |
| Phaseolus pauciflorus..... | |
| Phaseolus angulosus..... | |
| Phaseolus polystachyos..... | |
| Lathyrus palustris..... | Lathyrus palustris..... |
| Lathyrus palustris var. myr- | Lathyrus palustris var. myr- |
| tifolius..... | tifolius..... |
| Lathyrus glaucifolius..... | Lathyrus glaucifolius..... |
| Lathyrus venosus..... | Lathyrus venosus..... |
| Apios apios..... | |
| Vicia americana..... | Vicia americana..... |
| Vicia caroliniana..... | |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|-----------------------------|---|
| Vicia cracca..... | |
| | Lespedeza leptostachya..... |
| | Lespedeza frutescens..... |
| | Lespedeza hirta..... |
| | Lespedeza reticulata..... |
| | Lespedeza reticulata var. vir- ginica..... |
| | Lespedeza violacea..... |
| | Lespedeza repens..... |
| Pleurolobus canadensis..... | Pleurolobus canadensis..... |
| | Pleurolobus paniculatus..... |
| | Pleurolobus dillenii..... |
| | Pleurolobus canescens..... |
| | Pleurolobus grandiflorus..... |
| | Pleurolobus nudiflorus..... |
| Glycyrrhiza lepidota..... | Glycyrrhiza lepidota..... |
| | Spiesia splendens..... |
| Spiesia lamberti..... | Spiesia lamberti..... |
| | Astragalus lotiflorus..... |
| Astragalus flexuosus..... | Astragalus flexuosus..... |
| Astragalus hypoglottis..... | |
| Astragalus adsurgens..... | |
| | Astragalus parviflorus..... |
| Astragalus canadensis..... | Astragalus canadensis..... |
| | Astragalus plattensis..... |
| | Astragalus caryocarpus..... |
| Amorpha canescens..... | Amorpha canescens..... |
| Amorpha microphylla..... | Amorpha microphylla..... |
| | Amorpha fruticosa..... |
| | Cracca virginiana..... |
| | Kuhnistera villosa..... |
| | Kuhnistera candida..... |
| | Kuhnistera purpurea..... |
| | Dalea dalea..... |
| | Psoralea tenuiflora..... |
| | Psoralea esculenta..... |
| Psoralea incana..... | Psoralea incana..... |
| Lotus americana..... | Lotus americana..... |
| | Lupinus perennis..... |
| | <i>Geraniaceae.</i> |
| Geranium carolinianum..... | Geranium carolinianum..... |
| Geranium maculatum..... | Geranium maculatum..... |
| | <i>Oxalidaceae.</i> |
| | Oxalis stricta..... |
| | Oxalis longiflora..... |

of Minnesota Valley Metaspermic Species.—*Continued.*

| EASTERN. | WESTERN. |
|---|-------------------------------------|
| <i>Vicia cracca</i> | |
| <i>Lespedeza leptostachya</i> | |
| <i>Lespedeza frutescens</i> | |
| <i>Lespedeza hirta</i> | |
| <i>Lespedeza reticulata</i> | |
| <i>Lespedeza reticulata</i> var. <i>virginica</i> | |
| <i>Lespedeza violacea</i> | |
| <i>Lespedeza repens</i> | |
| <i>Pleurolobus canadensis</i> | |
| <i>Pleurolobus paniculatus</i> | |
| <i>Pleurolobus dillenii</i> | |
| <i>Pleurolobus canescens</i> | |
| <i>Pleurolobus grandiflorus</i> | |
| <i>Pleurolobus nudiflorus</i> | |
| <i>Glycyrrhiza lepidota</i> | <i>Glycyrrhiza lepidota</i> |
| | <i>Spiesia splendens</i> |
| <i>Spiesia lamberti</i> | |
| | <i>Astragalus lotiflorus</i> |
| | <i>Astragalus flexuosus</i> |
| | <i>Astragalus hypoglottis</i> |
| | <i>Astragalus adsurgens</i> |
| | <i>Astragalus parviflorus</i> |
| <i>Astragalus canadensis</i> | <i>Astragalus canadensis</i> |
| | <i>Astragalus plattensis</i> |
| | <i>Astragalus caryocarpus</i> |
| | <i>Amorpha canescens</i> |
| | <i>Amorpha microphylla</i> |
| <i>Amorpha fruticosa</i> | <i>Amorpha fruticosa</i> |
| <i>Cracca virginiana</i> | |
| | <i>Kuhnistera villosa</i> |
| | <i>Kuhnistera candida</i> |
| | <i>Kuhnistera purpurea</i> |
| | <i>Dalea dalea</i> |
| | <i>Psoralea tenuiflora</i> |
| | <i>Psoralea esculenta</i> |
| | <i>Psoralea incana</i> |
| | <i>Lotus americana</i> |
| <i>Lupinus perennis</i> | |
| | <i>Geraniaceae</i> . |
| <i>Geranium carolinianum</i> | <i>Geranium carolinianum</i> |
| <i>Geranium maculatum</i> | |
| | <i>Oxalidaceae</i> . |
| <i>Oxalis stricta</i> | <i>Oxalis stricta</i> |
| | <i>Oxalis longiflora</i> |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|------------------------------|-------------------------------------|
| <i>Linaceae.</i> | |
| | Linum rigidum..... |
| | Linum sulcatum..... |
| Linum lewisii..... | Linum lewisii..... |
| <i>Rutaceae.</i> | |
| Zanthoxylum americanum..... | Zanthoxylum americanum..... |
| | Ptelea trifoliata..... |
| <i>Polygalaceae.</i> | |
| | Polygala verticillata..... |
| Polygala paucifolia..... | Polygala paucifolia..... |
| Polygala senega..... | Polygala senega..... |
| | Polygala senega var. latifolia..... |
| | Polygala cruciata..... |
| | Polygala viridescens..... |
| <i>Euphorbiaceae.</i> | |
| | Ricinocarpus virginicus..... |
| | Euphorbia dictyosperma..... |
| | Euphorbia heterophylla..... |
| | Euphorbia corollata..... |
| | Euphorbia marginata..... |
| | Euphorbia nutans..... |
| | Euphorbia humistrata..... |
| | Euphorbia maculata..... |
| Euphorbia glyptosperma..... | Euphorbia glyptosperma..... |
| Euphorbia serpyllifolia..... | Euphorbia serpyllifolia..... |
| | Euphorbia geyeri..... |
| <i>Stellariaceae.</i> | |
| Stellaria verna..... | Stellaria verna..... |
| <i>Anacardiaceae.</i> | |
| | Rhus radicans..... |
| | Rhus vernix..... |
| | Rhus copallina..... |
| | Rhus glabra..... |
| | Rhus typhina..... |
| <i>Celastraceae.</i> | |
| | Evonymus atropurpureus..... |
| Celastrus scandens..... | Celastrus scandens..... |
| <i>Aquifoliaceae.</i> | |
| Ilex verticillata..... | Ilex verticillata..... |
| <i>Staphyleaceae.</i> | |
| Staphylea trifolia..... | Staphylea trifolia..... |
| <i>Aceraceae.</i> | |
| | Acer negundo..... |
| | Acer rubrum..... |
| Acer barbatum..... | Acer barbatum..... |

of Minnesota Valley Metaspermic Species.—*Continued.*

| EASTERN. | WESTERN. |
|----------------------------------|------------------------------|
| <i>Linaceae.</i> | |
| | Linum rigidum..... |
| Linum sulcatum | Linum sulcatum |
| | Linum lewisii..... |
| <i>Rutaceae.</i> | |
| Zanthoxylum americanum..... | |
| Ptelea trifoliata..... | |
| <i>Polygalaceae.</i> | |
| Polygala verticillata | Polygala verticillata |
| Polygala paucifolia | |
| Polygala senega | |
| Polygala senega var. latifolia.. | |
| Polygala cruciata..... | |
| Polygala viridescens..... | |
| <i>Euphorbiaceae.</i> | |
| Ricinocarpus virginicus..... | |
| | Euphorbia dictyosperma |
| | Euphorbia heterophylla..... |
| Euphorbia corollata..... | |
| | Euphorbia marginata..... |
| Euphorbia nutans..... | Euphorbia nutans..... |
| | Euphorbia humistrata..... |
| Euphorbia maculata..... | |
| | Euphorbia glyptosperma..... |
| | Euphorbia serpyllifolia..... |
| | Euphorbia geyeri..... |
| <i>Stellariaceae.</i> | |
| Stellaria verna..... | Stellaria verna..... |
| <i>Anacardiaceae.</i> | |
| Rhus radicans..... | |
| Rhus vernix..... | |
| Rhus copallina | |
| Rhus glabra..... | |
| Rhus typhina..... | |
| <i>Celastraceae.</i> | |
| Evonymus atropurpureus..... | |
| Celastrus scandens..... | |
| <i>Aquifoliaceae.</i> | |
| Ilex verticillata..... | |
| <i>Staphyleaceae.</i> | |
| Staphylea trifolia..... | |
| <i>Aceraceae.</i> | |
| Acer negundo..... | Acer negundo..... |
| Acer rubrum..... | |
| Acer barbatum..... | |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|-------------------------------|--------------------------------|
| | Acer barbatum var. nigrum... |
| | Acer saccharinum..... |
| Acer spicatum..... | |
| Acer pennsylvanicum..... | Acer pennsylvanicum..... |
| | <i>Balsaminaceae.</i> |
| Impatiens biflora..... | |
| Impatiens aurea..... | Impatiens aurea..... |
| | <i>Rhamnaceae.</i> |
| | Ceanothus ovatus..... |
| | Ceanothus americanus..... |
| Rhamnus alnifolia | |
| | <i>Vitaceae.</i> |
| | Parthenocissus quinquefolia. . |
| | Vitis aestivalis..... |
| | Vitis riparia..... |
| | Vitis cordifolia..... |
| | <i>Tiliaceae.</i> |
| Tilia americana..... | Tilia americana..... |
| | <i>Malvaceae</i> |
| | Malva triangulata..... |
| | Malva involucrata |
| | Napaea dioica..... |
| | Hibiscus militaris..... |
| | <i>Hypericaceae.</i> |
| | Hypericum canadense..... |
| | Hypericum gymnanthum..... |
| | Hypericum mutilum..... |
| Hypericum maculatum..... | Hypericum maculatum..... |
| | Hypericum prolificum..... |
| Hypericum ascyron..... | Hypericum ascyron..... |
| Hypericum virginicum..... | Hypericum virginicum..... |
| | <i>Cistaceae.</i> |
| | Helianthemum majus..... |
| Hudsonia tomentosa..... | Hudsonia tomentosa..... |
| | <i>Violaceae.</i> |
| Viola sylvestris..... | |
| Viola striata..... | Viola striata..... |
| Viola canadensis..... | |
| | Viola pubescens..... |
| Viola rotundifolia..... | |
| | Viola lanceolata..... |
| | Viola primulaefolia |
| Viola blanda..... | |
| Viola blanda var. amoena..... | Viola blanda var. amoena..... |
| Viola sagittata | Viola sagittata..... |

of Minnesota Valley Metaspermic Species.—Continued.

| EASTERN. | WESTERN. |
|---|--------------------------------|
| <i>Acer barbatum</i> var. <i>nigrum</i> | |
| <i>Acer saccharinum</i> | |
| <i>Acer spicatum</i> | |
| <i>Acer pennsylvanicum</i> | |
| <i>Balsami</i> naceae. | |
| <i>Impatiens biflora</i> | <i>Impatiens biflora</i> |
| <i>Impatiens aurea</i> | <i>Impatiens aurea</i> |
| <i>Rhamn</i> aceae. | |
| <i>Ceanothus ovatus</i> | <i>Ceanothus ovatus</i> |
| <i>Ceanothus americanus</i> | |
| <i>Rhamnus alnifolia</i> | |
| <i>Vita</i> ceae. | |
| <i>Parthenocissus quinquefolia</i> | |
| <i>Vitis aestivalis</i> | |
| <i>Vitis riparia</i> | |
| <i>Vitis cordifolia</i> | |
| <i>Tilia</i> ceae. | |
| <i>Tilia americana</i> | |
| <i>Malva</i> ceae. | |
| <i>Malva triangulata</i> | |
| | <i>Malva involucrata</i> |
| <i>Napaea dioica</i> | |
| <i>Hibiscus militaris</i> | |
| <i>Hyperic</i> aceae. | |
| <i>Hypericum canadense</i> | |
| <i>Hypericum gymnanthum</i> | |
| <i>Hypericum mutilum</i> | |
| <i>Hypericum maculatum</i> | |
| <i>Hypericum prolificum</i> | |
| <i>Hypericum ascyron</i> | |
| <i>Hypericum virginicum</i> | |
| <i>Cista</i> ceae. | |
| <i>Helianthemum majus</i> | |
| <i>Hudsonia tomentosa</i> | |
| <i>Viola</i> ceae. | |
| <i>Viola sylvestris</i> | <i>Viola sylvestris</i> |
| <i>Viola striata</i> | |
| <i>Viola canadensis</i> | <i>Viola canadensis</i> |
| <i>Viola pubescens</i> | |
| <i>Viola rotundifolia</i> | |
| <i>Viola lanceolata</i> | |
| <i>Viola primulaefolia</i> | |
| <i>Viola blanda</i> | <i>Viola blanda</i> |
| <i>Viola blanda</i> var. <i>amoena</i> | |
| <i>Viola sagittata</i> | |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|---|--|
| | <i>Viola palmata</i> |
| <i>Viola palmata</i> var. <i>obliqua</i> | <i>Viola palmata</i> var. <i>obliqua</i> ... |
| | <i>Viola palmata</i> var. <i>cordata</i> .. |
| | <i>Viola pedatifida</i> |
| <i>Viola pedata</i> | <i>Viola pedata</i> |
| | <i>Cactaceae</i> . |
| | <i>Opuntia fragilis</i> |
| | <i>Opuntia missouriensis</i> |
| | <i>Opuntia rafinesquii</i> |
| | <i>Thymelaeaceae</i> . |
| | <i>Dirca palustris</i> |
| | <i>Elaeagnaceae</i> . |
| <i>Leptargyria argentea</i> | <i>Leptargyria argentea</i> |
| <i>Elaeagnus argentea</i> | |
| | <i>Lythraceae</i> . |
| | <i>Lythrum alatum</i> |
| | <i>Oenotheraceae</i> . |
| <i>Isnardia palustris</i> | <i>Isnardia palustris</i> |
| | <i>Isnardia polycarpa</i> |
| <i>Gaura coccinea</i> | <i>Gaura coccinea</i> |
| | <i>Gaura biennis</i> |
| <i>Epilobium hornemanni</i> | |
| <i>Epilobium coloratum</i> | <i>Epilobium coloratum</i> |
| <i>Epilobium strictum</i> | |
| <i>Epilobium palustre</i> | |
| <i>Epilobium lineare</i> | |
| <i>Epilobium angustifolium</i> | <i>Epilobium angustifolium</i> |
| <i>Circaea alpina</i> | |
| <i>Circaea lutetiana</i> | <i>Circaea lutetiana</i> |
| | <i>Oenothera albicaulis</i> |
| | <i>Oenothera serrulata</i> |
| <i>Oenothera pumila</i> | |
| | <i>Oenothera rhombipetala</i> |
| <i>Oenothera biennis</i> | <i>Oenothera biennis</i> |
| | <i>Haloragidaceae</i> . |
| <i>Hippuris vulgaris</i> | <i>Hippuris vulgaris</i> |
| | <i>Myriophyllum heterophyllum</i> |
| | <i>Myriophyllum verticillatum</i> .. |
| <i>Myriophyllum spicatum</i> | <i>Myriophyllum spicatum</i> |
| | <i>Araliaceae</i> . |
| <i>Aralia trifolia</i> | <i>Aralia trifolia</i> |
| <i>Aralia quinquefolia</i> | <i>Aralia quinquefolia</i> |
| <i>Aralia nudicaulis</i> | |
| <i>Aralia hispida</i> | <i>Aralia hispida</i> |
| <i>Aralia racemosa</i> | <i>Aralia racemosa</i> |

of Minnesota Valley Metaspermic Species.—*Continued.*

| EASTERN. | WESTERN. |
|---------------------------------|-------------------------------|
| Viola palmata..... | |
| Viola palmata var. obliqua..... | Viola palmata var. obliqua... |
| Viola palmata var. cordata..... | |
| | Viola pedatifida..... |
| Viola pedata..... | |
| | <i>Cactaceae.</i> |
| | Opuntia fragilis..... |
| Opuntia rafinesquii..... | Opuntia missouriensis..... |
| | |
| Dirca palustris..... | <i>Thymelaeaceae.</i> |
| | |
| | <i>Elaeagnaceae.</i> |
| | Leptargyria argentea..... |
| Elaeagnus argentea..... | |
| | <i>Lythraceae.</i> |
| Lythrum alatum..... | |
| | <i>Oenotheraceae.</i> |
| Isnardia palustris..... | Isnardia palustris..... |
| Isnardia polycarpa..... | |
| | Gaura coccinea..... |
| Gaura biennis..... | Gaura biennis..... |
| Epilobium hornemanni..... | Epilobium hornemanni..... |
| Epilobium coloratum..... | |
| Epilobium strictum..... | |
| Epilobium palustre..... | Epilobium palustre..... |
| Epilobium lineare..... | Epilobium lineare..... |
| Epilobium angustifolium..... | Epilobium angustifolium..... |
| Circaea alpina..... | Circaea alpina..... |
| Circaea lutetiana..... | |
| | Oenothera albicaulis..... |
| | Oenothera serrulata..... |
| Oenothera pumila..... | |
| | Oenothera rhombipetala..... |
| Oenothera biennis..... | Oenothera biennis..... |
| | <i>Haloragidaceae.</i> |
| Hippuris vulgaris..... | Hippuris vulgaris..... |
| Myriophyllum heterophyllum.. | |
| Myriophyllum verticillatum.. | |
| Myriophyllum spicatum..... | |
| | <i>Araliaceae.</i> |
| Aralia trifolia..... | |
| Aralia quinquefolia..... | |
| Aralia nudicaulis..... | Aralia nudicaulis..... |
| Aralia hispida..... | |
| Aralia racemosa..... | |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|--|---|
| <i>Umbelliferae.</i> | |
| <i>Sanicula marylandica</i> | <i>Sanicula marylandica</i> |
| <i>Sanicula canadensis</i> | <i>Sanicula canadensis</i> |
| | <i>Eryngium aquaticum</i> |
| | <i>Polytaenia nuttallii</i> |
| <i>Heracleum lanatum</i> | <i>Heracleum lanatum</i> |
| | <i>Peucedanum nudicaule</i> |
| | <i>Tiedemannia rigida</i> |
| <i>Angelica atropurpurea</i> | |
| | <i>Angelica villosa</i> |
| | <i>Thaspium aureum</i> |
| <i>Thaspium aureum</i> var. <i>cordatum</i> | <i>Thaspium aureum</i> var. <i>cordatum</i> |
| | <i>Thaspium barbinode</i> |
| | <i>Zizia cordata</i> |
| <i>Zizia aurea</i> | <i>Zizia aurea</i> |
| | <i>Pimpinella integerrima</i> |
| <i>Cicuta bulbifera</i> | |
| <i>Cicuta virosa</i> var. <i>maculata</i> | <i>Cicuta virosa</i> var. <i>maculata</i> |
| | <i>Sium angustifolium</i> |
| <i>Sium cicutaefolium</i> | <i>Sium cicutaefolium</i> |
| <i>Deeringia canadensis</i> | <i>Deeringia canadensis</i> |
| | <i>Myrrhis claytoni</i> |
| <i>Myrrhis aristata</i> | <i>Myrrhis aristata</i> |
| <i>Cornaceae.</i> | |
| <i>Cornus canadensis</i> | |
| <i>Cornus alternifolia</i> | <i>Cornus alternifolia</i> |
| | <i>Cornus candidissima</i> |
| | <i>Cornus asperifolia</i> |
| <i>Cornus stolonifera</i> | |
| | <i>Cornus sericea</i> |
| <i>Cornus circinatus</i> | <i>Cornus circinatus</i> |
| <i>Pirolaceae.</i> | |
| | <i>Pseva maculata</i> |
| <i>Pseva umbellata</i> | <i>Pseva umbellata</i> |
| <i>Pirola secunda</i> | |
| <i>Pirola secunda</i> var. <i>pumila</i> | |
| <i>Pirola elliptica</i> | <i>Pirola elliptica</i> |
| <i>Pirola rotundifolia</i> | |
| <i>Pirola rotundifolia</i> var. <i>uliginosa</i> | |
| <i>Monotropa uniflora</i> | <i>Monotropa uniflora</i> |
| <i>Ericaceae.</i> | |
| <i>Ledum latifolium</i> | |
| <i>Andromeda polifolia</i> | |

of Minnesota Valley Metaspermic Species.—*Continued.*

| EASTERN. | WESTERN. |
|--|--|
| <i>Umbelliferae.</i> | |
| Sanicula marylandica | Sanicula marylandica..... |
| Sanicula canadensis..... | |
| Eryngium aquaticum..... | |
| Polytaenia nuttallii..... | Polytaenia nuttallii..... |
| Heracleum lanatum | Heracleum lanatum..... |
| | Peucedanum nudicaule..... |
| Tiedemannia rigida..... | |
| Angelica atropurpurea..... | |
| Angelica villosa..... | |
| Thaspium aureum..... | |
| Thaspium aureum var. corda- tum..... | Thaspium aureum var. corda- tum..... |
| Thaspium barbinode..... | |
| Zizia cordata..... | |
| Zizia aurea..... | Zizia aurea..... |
| Pimpinella integerrima..... | |
| Cicuta bulbifera..... | |
| Cicuta virosa var. maculata.... | Cicuta virosa var. maculata... |
| Sium angustifolium..... | Sium angustifolium..... |
| Sium cicutaefolium..... | Sium cicutaefolium..... |
| Deeringia canadensis..... | |
| Myrrhis claytoni..... | Myrrhis claytoni..... |
| Myrrhis aristata..... | |
| <i>Cornaceae.</i> | |
| Cornus canadensis..... | Cornus canadensis..... |
| Cornus alternifolia..... | |
| Cornus candidissima..... | |
| Cornus asperifolia | |
| Cornus stolonifera | Cornus stolonifera..... |
| Cornus sericea..... | |
| Cornus circinatus..... | |
| <i>Pirolaceae.</i> | |
| Pseva maculata..... | |
| Pseva umbellata..... | Pseva umbellata..... |
| Pirola secunda..... | Pirola secunda..... |
| Pirola secunda var. pumila.... | Pirola secunda var. pumila... |
| Pirola elliptica..... | Pirola elliptica..... |
| Pirola rotundifolia..... | Pirola rotundifolia..... |
| Pirola rotundifolia var. uligi- nosa..... | Pirola rotundifolia var. uligi- nosa..... |
| Monotropa uniflora..... | Monotropa uniflora..... |
| <i>Ericaceae.</i> | |
| Ledum latifolium..... | Ledum latifolium..... |
| Andromeda polifolia | Andromeda polifolia |

of Minnesota Valley Metaspermic Species.—*Continued.*

| EASTERN. | WESTERN. |
|---|--------------------------------------|
| <i>Lyonia calyculata</i> | <i>Lyonia calyculata</i> |
| <i>Chiogenes hispidula</i> | <i>Chiogenes hispidula</i> |
| <i>Arctostaphylos uva-ursi</i> | <i>Arctostaphylos uva-ursi</i> |
| <i>Oxycoccus macrocarpus</i> | <i>Oxycoccus macrocarpus</i> |
| <i>Oxycoccus oxycoccus</i> | <i>Oxycoccus oxycoccus</i> |
| <i>Vaccinium corymbosum</i> var. <i>amoenum</i> | |
| <i>Vaccinium canadense</i> | |
| <i>Vaccinium pennsylvanicum</i> | |
| <i>Vaccinium stamineum</i> | |
| <i>Primulaceae</i> . | |
| | <i>Androsace occidentalis</i> |
| <i>Lysimachia thyrsiflora</i> | <i>Lysimachia thyrsiflora</i> |
| <i>Lysimachia terrestris</i> | |
| <i>Steironema quadriflorum</i> | |
| <i>Steironema lanceolatum</i> var. <i>hybridum</i> | |
| <i>Steironema ciliatum</i> | <i>Steironema ciliatum</i> |
| <i>Trientalis americana</i> | |
| <i>Centunculus minimus</i> | <i>Centunculus minimus</i> |
| <i>Oleaceae</i> . | |
| <i>Fraxinus sambucifolia</i> | <i>Fraxinus sambucifolia</i> |
| <i>Fraxinus pubescens</i> | |
| <i>Fraxinus viridis</i> | |
| <i>Fraxinus americana</i> | |
| <i>Gentianaceae</i> . | |
| <i>Menyanthes trifoliata</i> | <i>Menyanthes trifoliata</i> |
| <i>Nymphodes lacunosum</i> | |
| <i>Gentiana linearis</i> var. <i>rubri-</i> <i>caulis</i> | |
| <i>Gentiana flavida</i> | |
| <i>Gentiana andrewsii</i> | |
| <i>Gentiana saponaria</i> | |
| <i>Gentiana puberula</i> | <i>Gentiana puberula</i> |
| <i>Gentiana quinquefolia</i> var. <i>oc-</i> <i>cidentalis</i> | |
| <i>Gentiana serrata</i> | <i>Gentiana serrata</i> |
| <i>Gentiana americana</i> | |
| <i>Apocynaceae</i> . | |
| <i>Apocynum cannabinum</i> | <i>Apocynum cannabinum</i> |
| <i>Apocynum androsaemifolium</i> .. | <i>Apocynum androsaemifolium</i> .. |
| <i>Asclepiadaceae</i> . | |
| | <i>Asclepias lanuginosa</i> |
| <i>Asclepias viridiflora</i> | |
| <i>Asclepias floridana</i> | |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|-------------------------------------|--|
| | <i>Asclepias verticillata</i> |
| | <i>Asclepias quadrifolia</i> |
| | <i>Asclepias ovalifolia</i> |
| | <i>Asclepias exaltata</i> |
| | <i>Asclepias obtusifolia</i> |
| | <i>Asclepias sullivantii</i> |
| | <i>Asclepias syriaca</i> |
| <i>Asclepias speciosa</i> | <i>Asclepias speciosa</i> |
| | <i>Asclepias incarnata</i> |
| | <i>Asclepias purpurascens</i> |
| | <i>Asclepias tuberosa</i> |
| | <i>Convolvulaceae</i> . |
| | <i>Volvulus spithameus</i> |
| <i>Volvulus sepium</i> | |
| | <i>Cuscuta paradoxa</i> |
| | <i>Cuscuta gronovii</i> |
| | <i>Cuscuta gronovii</i> var. <i>saururi</i> . |
| | <i>Cuscuta coryli</i> |
| | <i>Cuscuta cephalanthi</i> |
| | <i>Cuscuta arvensis</i> |
| | <i>Cuscuta polygonorum</i> |
| | <i>Polemoniaceae</i> . |
| | <i>Phlox divaricata</i> |
| | <i>Phlox pilosa</i> |
| | <i>Phlox glaberrima</i> |
| | <i>Phlox maculata</i> |
| <i>Collomia linearis</i> | |
| | <i>Polemonium reptans</i> |
| | <i>Hydrophyllaceae</i> . |
| <i>Macrocalyx nyctalea</i> | <i>Macrocalyx nyctalea</i> |
| | <i>Hydrophyllum appendiculatum</i> |
| <i>Hydrophyllum virginianum</i> ... | <i>Hydrophyllum virginianum</i> ... |
| | <i>Phacelia purshii</i> |
| | <i>Borraginaceae</i> . |
| | <i>Onosmodium carolinianum</i> ... |
| | <i>Onosmodium carolinianum</i> var. <i>molle</i> |
| | <i>Lithospermum angustifolium</i> |
| | <i>Lithospermum carolinense</i> ... |
| | <i>Lithospermum canescens</i> |
| | <i>Lithospermum latifolium</i> |
| | <i>Myosotis virginica</i> |
| | <i>Myosotis arvensis</i> |
| | <i>Lappula virginiana</i> |

of Minnesota Valley Metaspermic Species.—*Continued.*

| EASTERN. | WESTERN. |
|--|--------------------------------------|
| <i>Asclepias verticillata</i> | |
| <i>Asclepias quadrifolia</i> | |
| | <i>Asclepias ovalifolia</i> |
| <i>Asclepias exaltata</i> | |
| <i>Asclepias obtusifolia</i> | |
| | <i>Asclepias sullivantii</i> |
| <i>Asclepias syriaca</i> | |
| | <i>Asclepias speciosa</i> |
| <i>Asclepias incarnata</i> | |
| <i>Asclepias purpurascens</i> | |
| <i>Asclepias tuberosa</i> | <i>Asclepias tuberosa</i> |
| <i>Convolvulaceae.</i> | |
| <i>Volvulus spithameus</i> | |
| <i>Volvulus sepium</i> | <i>Volvulus sepium</i> |
| | <i>Cuscuta paradoxa</i> |
| <i>Cuscuta gronovii</i> | |
| <i>Cuscuta gronovii</i> var. <i>saururi</i> .. | |
| <i>Cuscuta coryli</i> | <i>Cuscuta coryli</i> |
| <i>Cuscuta cephalanthi</i> | <i>Cuscuta cephalanthi</i> |
| <i>Cuscuta arvensis</i> | <i>Cuscuta arvensis</i> |
| <i>Cuscuta polygonorum</i> | |
| <i>Polemoniaceae.</i> | |
| <i>Phlox divaricata</i> | |
| <i>Phlox pilosa</i> | |
| <i>Phlox glaberrima</i> | |
| <i>Phlox maculata</i> | |
| | <i>Collomia linearis</i> |
| <i>Polemonium reptans</i> | |
| <i>Hydrophyllaceae.</i> | |
| <i>Macrocalyx nyctalea</i> | <i>Macrocalyx nyctalea</i> |
| <i>Hydrophyllum appendiculatum</i> | |
| <i>Hydrophyllum virginianum</i> | <i>Hydrophyllum virginianum</i> .. |
| <i>Phacelia purshii</i> | |
| <i>Borraginaceae.</i> | |
| <i>Onosmodium carolinianum</i> | |
| <i>Onosmodium carolinianum</i> var. <i>molle</i> | |
| | <i>Lithospermum angustifolium</i> .. |
| <i>Lithospermum carolinense</i> | |
| <i>Lithospermum canescens</i> | <i>Lithospermum canescens</i> |
| <i>Lithospermum latifolium</i> | |
| <i>Myosotis virginica</i> | <i>Myosotis virginica</i> |
| <i>Myosotis arvensis</i> | |
| <i>Lappula virginiana</i> | |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|--|--|
| Lappula deflexa var. americana..... | Lappula deflexa var. americana..... |
| Lappula redowskii var. pilosa..... | Lappula redowskii var. pilosa..... |
| | Cynoglossum virginicum..... |
| | <i>Verbenaceae.</i> |
| | Leptostachya leptostachya... |
| | Verbena bracteosa..... |
| | Verbena stricta..... |
| | Verbena hastata..... |
| Verbena angustifolia..... | Verbena angustifolia..... |
| | Verbena urticaefolia..... |
| | <i>Labiatae.</i> |
| | Stachys aspera..... |
| Stachys palustris..... | Stachys palustris..... |
| | Physostegia virginiana..... |
| Brunella vulgaris..... | Brunella vulgaris..... |
| | Scutellaria parvula..... |
| Scutellaria galericulata..... | |
| Scutellaria lateriflora..... | |
| Dracocephalum parviflorum..... | |
| Vleckia foenicula..... | |
| | Vleckia scrophulariaefolia..... |
| | Vleckia nepetoides..... |
| | Monarda punctata..... |
| | Monarda fistulosa..... |
| | Hedeoma hispida..... |
| Acinos vulgaris..... | |
| | Koellia flexuosa..... |
| | Koellia virginiana..... |
| Lycopus sinuatus..... | Lycopus sinuatus..... |
| Lycopus lucidus var. obtusifolius..... | Lycopus lucidus var. obtusifolius..... |
| | Lycopus rubellus..... |
| Lycopus virginicus..... | Lycopus virginicus..... |
| Mentha canadensis..... | |
| Isanthus brachiatus..... | Teucrium canadense..... |
| | Isanthus brachiatus..... |
| | <i>Solanaceae.</i> |
| | Physalis lanceolata..... |
| | Physalis virginiana..... |
| | Physalis pubescens..... |
| | Physalis angulata..... |
| | Physalis philadelphica..... |
| Physalis grandiflora..... | |

of Minnesota Valley Metaspermic Species.—*Continued.*

| EASTERN. | WESTERN. |
|---------------------------------|--|
| | Lappula deflexa var. americana..... |
| | Lappula redowskii var. pilosa..... |
| Cynoglossum virginicum..... | |
| | Verbenaceae. |
| Leptostachya leptostachya..... | |
| | Verbena bracteosa..... |
| | Verbena stricta..... |
| Verbena hastata..... | Verbena hastata..... |
| Verbena angustifolia..... | |
| Verbena urticaefolia..... | Verbena urticaefolia..... |
| | Labiatae. |
| Stachys aspera..... | |
| Stachys palustris..... | Stachys palustris..... |
| Physostegia virginiana..... | |
| Brunella vulgaris..... | Brunella vulgaris..... |
| Scutellaria parvula..... | |
| Scutellaria galericulata..... | Scutellaria galericulata..... |
| Scutellaria lateriflora..... | Scutellaria lateriflora..... |
| Dracocephalum parviflorum.... | Dracocephalum parviflorum... |
| | Vleckia foenicula..... |
| Vleckia scrophulariaefolia..... | |
| Vleckia nepetoides..... | |
| Monarda punctata..... | |
| Monarda fistulosa..... | Monarda fistulosa..... |
| | Hedeoma hispida..... |
| Acinos vulgaris..... | Acinos vulgaris..... |
| Koellia flexuosa..... | |
| Koellia virginiana..... | |
| Lycopus sinuatus..... | Lycopus sinuatus..... |
| | Lycopus lucidus var. obtusifolius..... |
| Lycopus rubellus..... | |
| Lycopus virginicus..... | Lycopus virginicus..... |
| Mentha canadensis..... | Mentha canadensis..... |
| Teucrium canadense..... | |
| Isanthus brachiatus..... | |
| | Solanaceae. |
| Physalis lanceolata..... | Physalis lanceolata..... |
| Physalis virginiana..... | |
| Physalis pubescens..... | Physalis pubescens..... |
| Physalis angulata..... | |
| Physalis philadelphica..... | |
| Physalis grandiflora..... | |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|--|---|
| Solanum nigrum..... | Solanum nigrum..... |
| <i>Scrophulariaceae.</i> | Scrophularia nodosa var. marylandica..... |
| | Chelone glabra..... |
| | Penstemon acuminatus..... |
| | Penstemon grandiflorus..... |
| | Penstemon teretiflorus..... |
| Penstemon gracilis..... | Penstemon gracilis..... |
| | Penstemon hirsutus..... |
| | Mimulus glabratus var. jamesii..... |
| | Minulus ringens..... |
| | Gratiola virginiana..... |
| | Ilysanthes gratioloides..... |
| Veronica peregrina..... | Veronica peregrina..... |
| Veronica scutellata..... | |
| Veronica americana..... | |
| Veronica anagallis..... | |
| | Veronica virginica..... |
| | Synthyris houghtoniana..... |
| | Gerardia pedicularia..... |
| | Gerardia grandiflora..... |
| | Gerardia virginica..... |
| | Gerardia auriculata..... |
| | Gerardia aspera..... |
| | Gerardia purpurea..... |
| | Gerardia tenuifolia..... |
| | Gerardia tenuifolia var. asperula..... |
| | Castilleja sessiliflora..... |
| Castilleja pallida var. acuminata..... | |
| | Castilleja coccinea..... |
| Pedicularis lanceolata..... | Pedicularis lanceolata..... |
| | Pedicularis canadensis..... |
| Melampyrum lineare..... | |
| | Monniera rotundifolia..... |
| <i>Lentibulariaceae.</i> | Utricularia cornuta..... |
| Utricularia intermedia..... | |
| Utricularia minor..... | |
| Utricularia vulgaris..... | Utricularia vulgaris..... |
| <i>Orobanchaceae.</i> | Aphyllon ludovicianum..... |
| | Aphyllon fasciculatum..... |

of Minnesota Valley Metaspermic Species.—Continued.

| EASTERN. | WESTERN. |
|--|--|
| <i>Solanum nigrum</i> | <i>Solanum nigrum</i> |
| <i>Scrophulariaceae</i> . | |
| <i>Scrophularia nodosa</i> var. <i>marylandica</i> | <i>Scrophularia nodosa</i> var. <i>marylandica</i> |
| <i>Chelone glabra</i> | |
| | <i>Penstemon acuminatus</i> |
| | <i>Penstemon grandiflorus</i> |
| | <i>Penstemon teretiflorus</i> |
| | <i>Penstemon gracilis</i> |
| <i>Penstemon hirsutus</i> | |
| <i>Mimulus glabratus</i> var. <i>jamesii</i> | <i>Mimulus glabratus</i> var. <i>jamesii</i> |
| <i>Mimulus ringens</i> | |
| <i>Gratiola virginiana</i> | <i>Gratiola virginiana</i> |
| <i>Ilysanthes gratioloides</i> | <i>Ilysanthes gratioloides</i> |
| <i>Veronica peregrina</i> | <i>Veronica peregrina</i> |
| <i>Veronica scutellata</i> | <i>Veronica scutellata</i> |
| <i>Veronica americana</i> | <i>Veronica americana</i> |
| <i>Veronica anagallis</i> | <i>Veronica anagallis</i> |
| <i>Veronica virginica</i> | |
| <i>Synthyris houghtoniana</i> | |
| <i>Gerardia pedicularia</i> | |
| <i>Gerardia grandiflora</i> | |
| <i>Gerardia virginica</i> | |
| <i>Gerardia auriculata</i> | |
| | <i>Gerardia aspera</i> |
| <i>Gerardia purpurea</i> | |
| <i>Gerardia tenuifolia</i> | |
| <i>Gerardia tenuifolia</i> var. <i>asperula</i> | |
| <i>Castilleja sessiliflora</i> | <i>Castilleja sessiliflora</i> |
| <i>Castilleja pallida</i> var. <i>acuminata</i> | <i>Castilleja pallida</i> var. <i>acuminata</i> |
| <i>Castilleja coccinea</i> | |
| <i>Pedicularis lanceolata</i> | |
| <i>Pedicularis canadensis</i> | |
| <i>Melampyrum lineare</i> | <i>Melampyrum lineare</i> |
| <i>Monniera rotundifolia</i> | <i>Monniera rotundifolia</i> |
| <i>Lentibulariaceae</i> . | |
| <i>Utricularia cornuta</i> | |
| <i>Utricularia intermedia</i> | <i>Utricularia intermedia</i> |
| <i>Utricularia minor</i> | <i>Utricularia minor</i> |
| <i>Utricularia vulgaris</i> | <i>Utricularia vulgaris</i> |
| <i>Orobanchaceae</i> . | |
| <i>Aphyllon ludovicianum</i> | <i>Aphyllon ludovicianum</i> |
| | <i>Aphyllon fasciculatum</i> |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|--------------------------------|---------------------------------|
| | Aphyllon uniflorum..... |
| | <i>Plantaginaceae.</i> |
| | Plantago patagonica var. |
| | gnaphalioides..... |
| | Plantago rugelii..... |
| | Plantago major..... |
| | <i>Rubiaceae.</i> |
| | Houstonia purpurea var. cili- |
| | lata..... |
| Houstonia purpurea var. longi- | |
| folia..... | |
| Galium triflorum..... | Galium triflorum..... |
| Galium asprellum..... | Galium asprellum..... |
| | Galium concinnum..... |
| Galium trifidum..... | Galium trifidum..... |
| | Galium trifidum var. latifolium |
| Galium boreale..... | |
| Galium lanceolatum..... | Galium lanceolatum..... |
| | Galium circaezans..... |
| Galium aparine..... | Galium aparine..... |
| | <i>Caprifoliaceae.</i> |
| Linnaea borealis..... | |
| Symphoricarpos racemosus..... | |
| Symphoricarpos occidentalis .. | |
| | Symphoricarpos symphoricar- |
| | pos..... |
| Lonicera glauca..... | |
| Lonicera sullivantii .. | Lonicera sullivantii..... |
| Lonicera ciliata..... | |
| Diervilla diervilla..... | Diervilla diervilla..... |
| | Triosteum perfoliatum..... |
| Sambucus racemosa..... | |
| | Sambucus canadensis .. |
| Viburnum opulus .. | |
| | Viburnum pubescens..... |
| | Viburnum dentatum..... |
| Viburnum lentago..... | Viburnum lentago..... |
| | <i>Adoxaceae.</i> |
| Adoxa moschatellina..... | |
| | <i>Valerianaceae.</i> |
| | Valeriana edulis..... |
| | Valerianella radiata..... |
| | Valerianella chenopodifolia.. |
| | <i>Cucurbitaceae.</i> |
| | Sicyos angulatus..... |

of Minnesota Valley Metaspermic Species.—*Continued.*

| EASTERN. | WESTERN. |
|---------------------------------|-------------------------------|
| Aphyllon uniflorum..... | Aphyllon uniflorum |
| <i>Plantaginaceae.</i> | Plantago patagonica var. |
| | gnaphalioides.. |
| Plantago rugelii | |
| Plantago major..... | Plantago major..... |
| <i>Rubiaceae.</i> | |
| Houstonia purpurea var. cilio- | |
| lata | |
| Houstonia purpurea var. longi- | |
| folia..... | |
| Galium triflorum..... | Galium triflorum..... |
| Galium asprellum..... | |
| Galium concinnum..... | |
| Galium trifidum..... | Galium trifidum..... |
| Galium trifidum var. latifolium | |
| Galium boreale..... | Galium boreale..... |
| Galium lanceolatum..... | |
| Galium circaezans..... | |
| Galium aparine..... | Galium aparine..... |
| <i>Caprifoliaceae.</i> | |
| Linnaea borealis..... | Linnaea borealis..... |
| Symphoricarpos racemosus.... | Symphoricarpos racemosus... |
| | Symphoricarpos occidentalis.. |
| Symphoricarpos symphoricar- | |
| pos..... | |
| Lonicera glauca..... | Lonicera glauca..... |
| Lonicera sullivantii..... | Lonicera sullivantii..... |
| Lonicera ciliata..... | Lonicera ciliata..... |
| Diervilla diervilla..... | |
| Triosteum perfoliatum..... | |
| Sambucus racemosa..... | Sambucus racemosa..... |
| Sambucus canadensis..... | Sambucus canadensis..... |
| Viburnum opulus..... | Viburnum opulus..... |
| Viburnum pubescens..... | |
| Viburnum dentatum..... | |
| Viburnum lentago..... | |
| <i>Adoxaceae.</i> | |
| Adoxa moschatellina..... | Adoxa moschatellina..... |
| <i>Valerianaceae.</i> | |
| Valeriana edulis..... | Valeriana edulis |
| Valerianella radiata..... | |
| Valerianella chenopodifolia.... | |
| <i>Cucurbitaceae.</i> | |
| Sicyos angulatus..... | |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|--------------------------------------|--------------------------------------|
| Micrampelis echinata..... | Micrampelis echinata..... |
| <i>Campanulaceae.</i> | |
| | Campanula americana..... |
| Campanula aparinoides..... | |
| Campanula rotundifolia..... | Campanula rotundifolia..... |
| | Pentagonia perfoliata..... |
| Lobelia inflata..... | Lobelia inflata..... |
| Lobelia kalmii..... | |
| | Lobelia spicata..... |
| | Lobelia syphilitica..... |
| | Lobelia cardinalis..... |
| <i>Compositae.</i> | |
| | Vernonia fasciculata..... |
| | Vernonia noveboracensis..... |
| | Eupatorium ageratoides..... |
| | Eupatorium perfoliatum..... |
| | Eupatorium altissimum..... |
| | Eupatorium serotinum..... |
| Eupatorium purpureum..... | Eupatorium purpureum..... |
| | Kuhnia eupatorioides..... |
| | Kuhnia eupatorioides var. glu- |
| | tinosa..... |
| | Laciniaria spicata..... |
| | Laciniaria pycnostachya..... |
| | Laciniaria scariosa..... |
| | Laciniaria punctata..... |
| | Laciniaria cylindracea..... |
| | Laciniaria squarrosa..... |
| | Laciniaria squarrosa var. in- |
| | termedia..... |
| Grindelia squarrosa..... | Grindelia squarrosa..... |
| Diplogon villosum..... | Diplogon villosum..... |
| | Solidago occidentalis..... |
| Solidago graminifolia..... | |
| | Solidago riddelli..... |
| | Solidago rigida..... |
| | Solidago radula..... |
| | Solidago nemoralis..... |
| | Solidago nemoralis var. mollis..... |
| Solidago canadensis..... | Solidago canadensis..... |
| | Solidago serotina..... |
| Solidago serotina var. gigantea..... | Solidago serotina var. gigantea..... |
| | Solidago missouriensis..... |
| Solidago juncea..... | |
| Solidago neglecta..... | |

of Minnesota Valley Metaspermic Species.—*Continued.*

| EASTERN. | WESTERN. |
|---|--|
| Micrampelis echinata..... | Micrampelis echinata..... |
| <i>Campanulaceae.</i> | |
| Campanula americana..... | |
| Campanula aparinoides..... | |
| Campanula rotundifolia..... | Campanula rotundifolia..... |
| Pentagonia perfoliata..... | Pentagonia perfoliata..... |
| Lobelia inflata..... | |
| Lobelia kalmii..... | Lobelia kalmii..... |
| Lobelia spicata..... | |
| Lobelia syphilitica..... | |
| Lobelia cardinalis..... | |
| <i>Compositae.</i> | |
| | Vernonia fasciculata..... |
| Vernonia noveboracensis..... | |
| Eupatorium ageratoides..... | |
| Eupatorium perfoliatum..... | |
| Eupatorium altissimum..... | |
| Eupatorium serotinum..... | |
| Eupatorium purpureum..... | Eupatorium purpureum..... |
| | Kuhnia eupatorioides..... |
| | Kuhnia eupatorioides var. glutinosa..... |
| | |
| Laciniaria spicata..... | |
| | Laciniaria pycnostachya..... |
| Laciniaria scariosa..... | |
| | Laciniaria punctata..... |
| Laciniaria cylindracea..... | Laciniaria cylindracea..... |
| Laciniaria squarrosa..... | |
| Laciniaria squarrosa var. intermedia..... | |
| | Grindelia squarrosa..... |
| | Diplogon villosum..... |
| | Solidago occidentalis..... |
| Solidago graminifolia..... | Solidago graminifolia..... |
| Solidago riddellii..... | Solidago riddellii..... |
| Solidago rigida..... | Solidago rigida..... |
| | Solidago radula..... |
| Solidago nemoralis..... | Solidago nemoralis..... |
| | Solidago nemoralis var. mollis..... |
| Solidago canadensis..... | Solidago canadensis..... |
| Solidago serotina..... | Solidago serotina..... |
| Solidago serotina var. gigantea..... | Solidago serotina var. gigantea..... |
| | Solidago missouriensis..... |
| Solidago juncea..... | |
| Solidago neglecta..... | |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|---|---|
| | <i>Solidago rugosa</i> |
| | <i>Solidago patula</i> |
| | <i>Solidago speciosa</i> |
| | <i>Solidago speciosa</i> var. <i>rigidius-</i> <i>cula</i> |
| | <i>Solidago speciosa</i> var. <i>erecta</i> |
| <i>Solidago latifolia</i> | <i>Solidago latifolia</i> |
| | <i>Solidago caesia</i> |
| | <i>Haplopappus spinulosus</i> |
| | <i>Boltonia asteroides</i> |
| <i>Aster ptarmicoides</i> | |
| <i>Aster umbellatus</i> | <i>Aster umbellatus</i> |
| <i>Aster puniceus</i> | <i>Aster puniceus</i> |
| <i>Aster puniceus</i> var. <i>lucidus</i> | <i>Aster puniceus</i> var. <i>lucidus</i> .. |
| | <i>Aster nova belgii</i> |
| <i>Aster longifolius</i> | |
| <i>Aster junceus</i> | |
| <i>Aster salicifolius</i> | <i>Aster salicifolius</i> |
| | <i>Aster paniculatus</i> |
| | <i>Aster lateriflorus</i> |
| | <i>Aster vimineus</i> |
| | <i>Aster dumosus</i> |
| | <i>Aster multiflorus</i> |
| | <i>Aster ericoides</i> var. <i>villosus</i> .. |
| <i>Aster polyphyllus</i> | <i>Aster polyphyllus</i> |
| <i>Aster laevis</i> | <i>Aster laevis</i> |
| | <i>Aster drummondii</i> |
| | <i>Aster sagittaeifolius</i> |
| <i>Aster cordifolius</i> | <i>Aster cordifolius</i> |
| | <i>Aster undulatus</i> |
| | <i>Aster azureus</i> |
| | <i>Aster patens</i> |
| | <i>Aster sericeus</i> |
| | <i>Aster novae-angliae</i> |
| | <i>Aster oblongifolius</i> |
| <i>Aster macrophyllus</i> | <i>Aster macrophyllus</i> |
| | <i>Aster asteroides</i> |
| <i>Aster divaricatus</i> | <i>Aster divaricatus</i> |
| <i>Erigeron philadelphicus</i> | <i>Erigeron philadelphicus</i> |
| <i>Erigeron pulchellus</i> | <i>Erigeron pulchellus</i> |
| <i>Erigeron glabellus</i> | |
| | <i>Erigeron ramosus</i> |
| | <i>Erigeron annuus</i> |
| | <i>Erigeron divaricatus</i> |
| <i>Erigeron canadensis</i> | <i>Erigeron canadensis</i> |

of Minnesota Valley Metaspermic Species.—Continued.

| EASTERN. | WESTERN. |
|---|--|
| <i>Solidago rugosa</i> | |
| <i>Solidago patula</i> | |
| <i>Solidago speciosa</i> | |
| | <i>Solidago speciosa</i> var. <i>rigidius-</i> |
| <i>Solidago speciosa</i> var. <i>erecta</i> .. | <i>cula</i> |
| <i>Solidago latifolia</i> | |
| <i>Solidago caesia</i> | |
| | <i>Haplopappus spinulosus</i> |
| <i>Boltonia asteroides</i> | |
| <i>Aster ptarmicoides</i> | <i>Aster ptarmicoides</i> |
| <i>Aster umbellatus</i> | |
| <i>Aster puniceus</i> | <i>Aster puniceus</i> |
| <i>Aster puniceus</i> var. <i>lucidus</i> | |
| <i>Aster nova-belgii</i> | |
| <i>Aster longifolius</i> | <i>Aster longifolius</i> |
| <i>Aster junceus</i> | |
| <i>Aster salicifolius</i> | |
| <i>Aster paniculatus</i> | |
| <i>Aster lateriflorus</i> | |
| <i>Aster vimineus</i> | |
| <i>Aster dumosus</i> | |
| <i>Aster multiflorus</i> | <i>Aster multiflorus</i> |
| <i>Aster ericoides</i> var. <i>villosus</i> ... | |
| <i>Aster polyphyllus</i> | |
| <i>Aster laevis</i> | |
| | <i>Aster drummondii</i> |
| <i>Aster sagittaeifolius</i> | |
| <i>Aster cordifolius</i> | |
| <i>Aster undulatus</i> | |
| <i>Aster azureus</i> | <i>Aster azureus</i> |
| <i>Aster patens</i> | |
| <i>Aster sericeus</i> | <i>Aster sericeus</i> |
| <i>Aster novae angliae</i> | <i>Aster novae-angliae</i> |
| <i>Aster oblongifolius</i> | |
| <i>Aster macrophyllus</i> | |
| <i>Aster asteroides</i> | |
| <i>Aster divaricatus</i> | |
| <i>Erigeron philadelphicus</i> | <i>Erigeron philadelphicus</i> |
| <i>Erigeron pulchellus</i> | |
| | <i>Erigeron glabellus</i> |
| <i>Erigeron ramosus</i> | <i>Erigeron ramosus</i> |
| <i>Erigeron annuus</i> | <i>Erigeron annuus</i> |
| | <i>Erigeron divaricatus</i> |
| <i>Erigeron canadensis</i> | <i>Erigeron canadensis</i> |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|---|--|
| <i>Antennaria plantaginifolia</i> | <i>Antennaria plantaginifolia</i> |
| <i>Anaphalis margaritacea</i> | |
| <i>Gnaphalium uliginosum</i> | |
| <i>Gnaphalium decurrens</i> | <i>Gnaphalium decurrens</i> |
| | <i>Gnaphalium obtusifolium</i> |
| <i>Adenocaulon bicolor</i> | |
| | <i>Polymnia canadensis</i> |
| | <i>Silphium perfoliatum</i> |
| | <i>Silphium integrifolium</i> |
| | <i>Silphium terebinthinaceum</i> ... |
| | <i>Silphium laciniatum</i> |
| | <i>Parthenium integrifolium</i> |
| | <i>Cyclachaena xanthiifolia</i> |
| | <i>Ambrosia psilostachya</i> |
| <i>Ambrosia artemisiaefolia</i> | <i>Ambrosia artemisiaefolia</i> |
| | <i>Ambrosia trifida</i> |
| | <i>Ambrosia trifida</i> var. <i>integrifolia</i> |
| | <i>Xanthium canadense</i> |
| <i>Xanthium canadense</i> var. <i>echinatum</i> | <i>Xanthium canadense</i> var. <i>echinatum</i> |
| | <i>Heliopsis scabra</i> |
| | <i>Rudbeckia columnaris</i> |
| | <i>Rudbeckia pinnata</i> |
| | <i>Rudbeckia hirta</i> |
| | <i>Rudbeckia subtomentosa</i> |
| | <i>Rudbeckia laciniata</i> |
| | <i>Rudbeckia angustifolia</i> |
| <i>Helianthus tuberosus</i> | <i>Helianthus tuberosus</i> |
| | <i>Helianthus tuberosus</i> var. <i>subcanescens</i> |
| <i>Helianthus decapetalus</i> | <i>Helianthus decapetalus</i> |
| | <i>Helianthus tracheliiifolius</i> |
| <i>Helianthus strumosus</i> | <i>Helianthus strumosus</i> |
| | <i>Helianthus hirsutus</i> |
| | <i>Helianthus divaricatus</i> |
| | <i>Helianthus maxmiliani</i> |
| | <i>Helianthus giganteus</i> |
| | <i>Helianthus grosse-serratus</i> ... |
| | <i>Helianthus laetiflorus</i> |
| | <i>Helianthus rigidus</i> |
| | <i>Helianthus petiolaris</i> |
| | <i>Helianthus annuus</i> |
| | <i>Coreopsis aristosa</i> |
| | <i>Coreopsis trichosperma</i> |

of Minnesota Valley Metaspermic Species.—*Continued.*

| EASTERN. | WESTERN. |
|--|--|
| <i>Antennaria plantaginifolia</i> | <i>Antennaria plantaginifolia</i> |
| <i>Anaphalis margaritacea</i> | <i>Anaphalis margaritacea</i> |
| <i>Gnaphalium uliginosum</i> | <i>Gnaphalium uliginosum</i> |
| <i>Gnaphalium decurrens</i> | <i>Gnaphalium decurrens</i> |
| <i>Gnaphalium obtusifolium</i> | |
| | <i>Adenocaulon bicolor</i> |
| <i>Polymnia canadensis</i> | |
| <i>Silphium perfoliatum</i> | |
| <i>Silphium integrifolium</i> | |
| <i>Silphium terebinthinaceum</i> | |
| | <i>Silphium laciniatum</i> |
| <i>Parthenium integrifolium</i> | |
| | <i>Cyclachaena xanthiifolia</i> |
| <i>Ambrosia artemisiaefolia</i> | <i>Ambrosia psilostachya</i> |
| <i>Ambrosia trifida</i> | |
| <i>Ambrosia trifida</i> var. <i>integri-</i> <i>folia</i> | |
| | <i>Xanthium canadense</i> |
| <i>Xanthium canadense</i> var. <i>echi-</i> <i>natum</i> | |
| <i>Heliopsis scabra</i> | <i>Heliopsis scabra</i> |
| | <i>Rudbeckia columnaris</i> |
| <i>Rudbeckia pinnata</i> | |
| <i>Rudbeckia hirta</i> | |
| <i>Rudbeckia subtomentosa</i> | <i>Rudbeckia subtomentosa</i> |
| <i>Rudbeckia laciniata</i> | <i>Rudbeckia laciniata</i> |
| <i>Rudbeckia angustifolia</i> | |
| <i>Helianthus tuberosus</i> | |
| | <i>Helianthus tuberosus</i> var. <i>sub-</i> <i>canescens</i> |
| <i>Helianthus decapetalus</i> | |
| <i>Helianthus tracheliiifolius</i> | |
| <i>Helianthus strumosus</i> | |
| <i>Helianthus hirsutus</i> | |
| <i>Helianthus divaricatus</i> | |
| | <i>Helianthus maxmiliani</i> |
| <i>Helianthus giganteus</i> | <i>Helianthus giganteus</i> |
| <i>Helianthus grosse-serratus</i> | <i>Helianthus grosse-serratus</i> ... |
| <i>Helianthus laetiflorus</i> | <i>Helianthus laetiflorus</i> |
| | <i>Helianthus rigidus</i> |
| | <i>Helianthus petiolaris</i> |
| | <i>Helianthus annuus</i> |
| <i>Coreopsis aristosa</i> | <i>Coreopsis aristosa</i> |
| <i>Coreopsis trichosperma</i> | |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|---|---|
| | <i>Coreopsis palmata</i> |
| | <i>Coreopsis tinctoria</i> |
| <i>Bidens beckii</i> | <i>Bidens beckii</i> |
| | <i>Bidens laevis</i> |
| <i>Bidens cernua</i> | <i>Bidens cernua</i> |
| | <i>Bidens connata</i> |
| | <i>Bidens frondosa</i> |
| <i>Helenium autumnale</i> | <i>Helenium autumnale</i> |
| | <i>Gaillardia aristata</i> |
| | <i>Dyssodia papposa</i> |
| <i>Achillea millefolium</i> | <i>Achillea millefolium</i> |
| <i>Artemisia frigida</i> | <i>Artemisia frigida</i> |
| <i>Artemisia biennis</i> | |
| <i>Artemisia gnaphalodes</i> | <i>Artemisia gnaphalodes</i> |
| <i>Artemisia longifolia</i> | <i>Artemisia longifolia</i> |
| | <i>Artemisia serrata</i> |
| <i>Artemisia dracunculoides</i> | <i>Artemisia dracunculoides</i> |
| <i>Artemisia canadensis</i> | <i>Artemisia canadensis</i> |
| | <i>Artemisia caudata</i> |
| | <i>Erechthites hieracifolia</i> |
| | <i>Senecio ovatus</i> |
| | <i>Senecio atriplicifolius</i> |
| | <i>Senecio reniformis</i> |
| <i>Senecio lugens</i> | <i>Senecio lugens</i> |
| <i>Senecio integerrimus</i> | |
| | <i>Senecio tomentosus</i> |
| <i>Senecio aureus</i> | <i>Senecio aureus</i> |
| | <i>Senecio aureus</i> var. <i>pauperculus</i> |
| <i>Senecio aureus</i> var. <i>obovatus</i> .. | <i>Senecio aureus</i> var. <i>obovatus</i> .. |
| <i>Senecio palustris</i> | |
| <i>Cnicus odoratus</i> | <i>Cnicus odoratus</i> |
| | <i>Cnicus muticus</i> |
| <i>Cnicus discolor</i> | <i>Cnicus discolor</i> |
| | <i>Cnicus altissimus</i> |
| <i>Cnicus undulatus</i> | <i>Cnicus undulatus</i> |
| <i>Lactuca spicata</i> | <i>Lactuca spicata</i> |
| | <i>Lactuca floridana</i> |
| <i>Lactuca pulchella</i> | <i>Lactuca pulchella</i> |
| | <i>Lactuca ludoviciana</i> |
| | <i>Lactuca hirsuta</i> |
| <i>Lactuca canadensis</i> | <i>Lactuca canadensis</i> |
| <i>Taraxacum taraxacum</i> | <i>Taraxacum taraxacum</i> |
| <i>Nothocalais cuspidatum</i> | <i>Nothocalais cuspidatum</i> |
| <i>Agoseris glauca</i> | <i>Agoseris glauca</i> |

of Minnesota Valley Metaspermic Species.—Continued.

| EASTERN. | WESTERN. |
|---|---|
| | <i>Coreopsis palmata</i> |
| | <i>Coreopsis tinctoria</i> |
| <i>Bidens beckii</i> | |
| <i>Bidens laevis</i> | <i>Bidens laevis</i> |
| <i>Bidens cernua</i> | <i>Bidens cernua</i> |
| <i>Bidens connata</i> | |
| <i>Bidens frondosa</i> | |
| <i>Helenium autumnale</i> | <i>Helenium autumnale</i> |
| | <i>Gaillardia aristata</i> |
| <i>Dyssodia papposa</i> | <i>Dyssodia papposa</i> |
| <i>Achillea millefolium</i> | <i>Achillea millefolium</i> |
| | <i>Artemisia frigida</i> |
| <i>Artemisia biennis</i> | <i>Artemisia biennis</i> |
| | <i>Artemisia gnaphalodes</i> |
| | <i>Artemisia longifolia</i> |
| <i>Artemisia serrata</i> | <i>Artemisia serrata</i> |
| | <i>Artemisia dracunculoides</i> |
| <i>Artemisia canadensis</i> | <i>Artemisia canadensis</i> |
| <i>Artemisia caudata</i> | |
| <i>Erechthites hieracifolia</i> | |
| <i>Senecio ovatus</i> | |
| <i>Senecio atriplicifolius</i> | |
| <i>Senecio reniformis</i> | |
| | <i>Senecio lugens</i> |
| | <i>Senecio integerrimus</i> |
| <i>Senecio tomentosus</i> | |
| <i>Senecio aureus</i> | <i>Senecio aureus</i> |
| <i>Senecio aureus</i> var. <i>pauperculus</i> | <i>Senecio aureus</i> var. <i>pauperculus</i> |
| <i>Senecio aureus</i> var. <i>obovatus</i> .. | |
| <i>Senecio palustris</i> | <i>Senecio palustris</i> |
| <i>Cnicus odoratus</i> | |
| <i>Cnicus muticus</i> | |
| <i>Cnicus discolor</i> | |
| <i>Cnicus altissimus</i> | |
| | <i>Cnicus undulatus</i> |
| <i>Lactuca spicata</i> | <i>Lactuca spicata</i> |
| <i>Lactuca floridana</i> | |
| <i>Lactuca pulchella</i> | <i>Lactuca pulchella</i> |
| | <i>Lactuca ludoviciana</i> |
| <i>Lactuca hirsuta</i> | |
| <i>Lactuca canadensis</i> | |
| <i>Taraxacum taraxacum</i> | <i>Taraxacum taraxacum</i> |
| | <i>Nothocalais cuspidatum</i> |
| | <i>Agoseris glauca</i> |

D. Table Illustrating General Continental Range

| NORTHERN. | SOUTHERN. |
|--------------------------|-----------------------------|
| | Adopogon virginicum..... |
| Lygodesmia juncea..... | Lygodesmia juncea..... |
| | Prenanthes serpentaria..... |
| Prenanthes alba..... | Prenanthes alba..... |
| | Prenanthes aspera..... |
| Prenanthes racemosa..... | Prenanthes racemosa..... |
| | Prenanthes crepidinea..... |
| Crepis runcinata..... | |
| | Hieracium longipilum..... |
| Hieracium venosum..... | Hieracium venosum..... |
| Hieracium canadense..... | |

Before proceeding with the range statistics, a table of general statistics is herewith presented:

| 15. Representation of Species. | | | |
|--------------------------------|-----------------|---------------------------|------------------------------------|
| | No. of species. | Per cent. of all species. | Av. no. of species per genus. |
| Monocotyledones..... | 334 | 28.4 | 3.15 |
| Archichlamydeae..... | 459 | 39.1 | 2.63 |
| Metachlamydeae..... | 381 | 32.3 | 2.97 |
| Total no. val. species. | 1174 | | General av. no. per genus.....2.87 |

The larger average per cent. of species to the genus in the Monocotyledones is due to the influence in that group of the genus *Carex*, among other conditions. In addition, the general dispersion which has been supposed to mark the taxonomic group of the Monocotyledones in particular, has doubtless its influence on the average number of species per genus. Passing next to the statistics condensed from Table D, we isolate first the four principal range elements. These are :

- (1) The Northern Specific Element.
- (2) The Southern Specific Element.
- (3) The Eastern Specific Element.
- (4) The Western Specific Element.

of Minnesota Valley Metaspermic Species.—Continued.

| EASTERN. | WESTERN. |
|-----------------------------|---------------------------|
| Adopogon virginicum..... | Adopogon virginicum..... |
| | Lygodesmia juncea |
| Prenanthes serpentaria..... | |
| Prenanthes alba | |
| Prenanthes aspera..... | |
| Prenanthes racemosa..... | |
| Prenanthes crepidinea..... | |
| | Crepis runcinata..... |
| Hieracium longipilum..... | Hieracium longipilum..... |
| Hieracium venosum | |
| Hieracium canadense..... | Hieracium canadense..... |

Taking these up in order, let us first note the character of the northern element :

| 16. The Northern Specific Element. | | | |
|------------------------------------|-----------------|----------------------------|-----------------------------|
| | No. of species. | Per cent. of all Northern. | Northern per cent. of each. |
| Monocotyledones | 226 | 35.2 | 68.2 |
| Archichlamydeae | 257 | 40.0 | 55.9 |
| Metachlamydeae | 159 | 24.7 | 41.6 |
| Total Northern..... | 642 | | |
| North'n per cent. of all species | 55.6 | | |

In this table, as in the next three of its series, there is an exact parallelism with the four generic tables of similar construction. While the Archichlamydeae from their number form the larger percentages of each range-element, the taxonomic groups themselves analyse as before by range-elements. The other three tables may now be added.

17. The Southern Specific Element.

| | No. of species. | Per cent. of all Southern. | Southern per cent. of each |
|----------------------------------|-----------------|----------------------------|----------------------------|
| Monocotyledones..... | 229 | 25.6 | 69.1 |
| Archichlamydeae..... | 344 | 38.5 | 75.1 |
| Metachlamydeae..... | 319 | 35.7 | 83.9 |
| Total Southern..... | 892 | | |
| Southern per cent of all species | 76.1 | | |

18. The Eastern Specific Element.

| | No. of species. | Per cent. of all Eastern. | Eastern per cent. of each |
|----------------------------------|-----------------|---------------------------|---------------------------|
| Monocotyledones | 310 | 30.3 | 93.6 |
| Archichlamydeae..... | 396 | 38.7 | 86.1 |
| Metachlamydeae | 316 | 30.9 | 82.9 |
| Total Eastern..... | 1,022 | | |
| Eastern per cent. of all species | 87.2 | | |

19. The Western Specific Element.

| | No. of species. | Per cent. of all Western. | Western per cent. of each. |
|-------------------------------|-----------------|---------------------------|----------------------------|
| Monocotyledones..... | 176 | 29.1 | 53.1 |
| Archichlamydeae | 229 | 37.9 | 49.6 |
| Metachlamydeae..... | 198 | 32.8 | 51.9 |
| Total Western. | 603 | | |
| Western per cent. of all..... | 51.4 | | |

The general parallelism between these tables and those of the generic range-elements need not be noted here in detail. As before, the largest figure is that which indicates the eastern range-per cent. of the Monocotyledones. The even north and south range of the Monocotyledones is to be observed, together with the preponderant southward massing of the Metachlamydeae. The eastern and western percentages of Metachlamydeae are found to approach each other more closely than such percentages in the other two groups,—indicating as before, the comparative lateral solidarity of the Metachlamydeae, to be set over against the comparative longitudinal solidarity of the Monocotyledones. In both cases the Archichlamydeae are seen to occupy the intermediate position. As a whole the metaspermic flora of the Minnesota valley presents itself as distinctly eastern and southern by species as before by genera. The statistics are as follows:

| | | | |
|---------------------|-------|-------------------------------------|------|
| Total Northern..... | 642 | Northern per cent. of all species.. | 55.6 |
| Total Southern..... | 892 | Southern per cent. of all species.. | 76.1 |
| Total Eastern..... | 1,022 | Eastern per cent. of all species... | 87.2 |
| Total Western..... | 603 | Western per cent. of all species... | 51.4 |

It is possible, too, from Table D. to determine certain compound-ranges, both numerically and by percentages. Upon examining the table it will appear that the following groups may be isolated for study:

- (1) North-East Specific Element. NE.
- (2) North-West Specific Element. NW.
- (3) North-East-West Specific Element. NEW.
- (4) North-South-West Specific Element. NSW.
- (5) North-South-East Specific Element. NSE.
- (6) North-South-East-West Specific Element. NSEW.
- (7) South-East Specific Element. SE.
- (8) South-West Specific Element. SW.
- (9) South-East-West Specific Element. SEW.

The tables of these nine combination groups are as follows

| 20. The North-East Specific Element. | | | |
|--------------------------------------|-----------------|------------------------|--------------------------|
| | No. of species. | Per cent. of all N. E. | N. E. per cent. of each. |
| Monocotyledones..... | 24 | 41.9 | 7.2 |
| Archichlamydeae | 20 | 35.7 | 4.3 |
| Metachlamydeae | 12 | 21.4 | 3.1 |
| Total N. E..... | 56 | | |
| N. E. per cent. of all species..... | 4.7 | | |

| 21. The North-West Specific Element. | | | |
|--------------------------------------|-----------------|------------------------|--------------------------|
| | No. of species. | Per cent. of all N. W. | N. W. per cent. of each. |
| Monocotyledones..... | 6 | 21.4 | 1.8 |
| Archichlamydeae..... | 15 | 53.5 | 3.2 |
| Metachlamydeae | 7 | 25.0 | 1.8 |
| Total N. W..... | 28 | | |
| N. W. per cent. of all species..... | 2.3 | | |

| 22. The North-East-West Specific Element. | | | |
|---|----------------|---------------------------|-----------------------------|
| | No of species. | Per cent. of all N. E. W. | N. E. W. per cent. of each. |
| Monocotyledones..... | 72 | 36.7 | 21.4 |
| Archichlamydeae..... | 80 | 40.8 | 17.2 |
| Metachlamydeae | 44 | 22.4 | 11.5 |
| Total N. E. W..... | 196 | | |
| N. E. W. per cent. of all species..... | 16.7 | | |

23. The North-South-East Specific Element.

| | No. of species. | Per cent. of all N. S. E. | N. S. E. per cent. of each. |
|-----------------------------------|-----------------|---------------------------|-----------------------------|
| Monocotyledones | 59 | 38.6 | 14.4 |
| Archichlamydeae | 70 | 40.9 | 15.2 |
| Metachlamydeae | 32 | 19.8 | 8.4 |
| Total N. S. E. | 161 | | |
| N. S. E. per cent. of all species | 13.6 | | |

24. The North-South-West Specific Element.

| | No. of species. | Per cent. of all N. S. W. | N. S. W. per cent. of each. |
|-----------------------------------|-----------------|---------------------------|-----------------------------|
| Monocotyledones | 5 | 12.8 | 1.5 |
| Archichlamydeae | 15 | 38.4 | 3.2 |
| Metachlamydeae | 19 | 48.7 | 4.9 |
| Total N. S. W. | 39 | | |
| N. S. W. per cent. of all species | 3.5 | | |

25. The North-South-East-West Specific Element.

| | No. of species. | Per cent. of all N. S. E. W. | N. S. E. W. per cent. of each. |
|------------------------------------|-----------------|------------------------------|--------------------------------|
| Monocotyledones | 62 | 41.3 | 18.7 |
| Archichlamydeae | 54 | 36.0 | 11.7 |
| Metachlamydeae | 34 | 22.7 | 8.9 |
| Total N. S. E. W. | 150 | | |
| N.S.E.W. per ct. of all species... | 12.8 | | |

26. The South-East Specific Element.

| | No. of species. | Per cent. of all S. E. | S. E. per cent. of each. |
|-----------------------------------|-----------------|------------------------|--------------------------|
| Monocotyledones..... | 69 | 19.7 | 17.5 |
| Archichlamydeae..... | 141 | 40.2 | 30.5 |
| Metachlamydeae..... | 140 | 40.0 | 36.8 |
| Total S. E..... | 350 | | |
| S. E. per cent. of all species... | 32.5 | | |

27. The South-West Specific Element.

| | No. of species. | Per cent. of all S. W. | S. W. per cent. of each. |
|----------------------------------|-----------------|------------------------|--------------------------|
| Monocotyledones..... | 11 | 12.6 | 3.3 |
| Archichlamydeae..... | 35 | 40.2 | 7.9 |
| Metachlamydeae..... | 41 | 47.1 | 10.7 |
| Total S. W..... | 87 | | |
| S. W. per cent. of all species.. | 7.5 | | |

28. The South-East-West Specific Element.

| | No. of species. | Per cent. of all S. E. W. | S. E. W. per cent of each. |
|------------------------------------|-----------------|---------------------------|----------------------------|
| Monocotyledones..... | 22 | 22.0 | 6.6 |
| Archichlamydeae..... | 27 | 27.0 | 5.8 |
| Metachlamydeae..... | 51 | 51.0 | 13.1 |
| Total S. E. W..... | 100 | | |
| S. E. W. per cent. of all species. | 8.5 | | |

From the nine tables preceding it will be observed that the SE. element, forming 32.5 per cent. of the total species, is the largest numerically, while the NE., with but 2.3 per cent. of the total species, is the smallest. The NEW. element, forming 16.7 per cent. of the total, is larger than the SEW. element, which forms but 8.5 per cent. of the total. General east and west ranging is more characteristic, then, of the northern than of the southern element, and this fact is quite in accord with the greater dispersion of the northern floral elements. Of the NEW. element the actual percentages of Monocotyledones and Archichlamydeae are in excess of the Metachlamydeae percentages, while in the SEW. element the reverse is the case. These range-elements form similar percentages of the taxonomic groups. Of the Monocotyledones and Archichlamydeae, respectively, 21.4 per cent. and 17.2 per cent. are placed in the NEW. element, while of the Metachlamydeae only 11.5 per cent. are so enrolled. On the other hand, in the Metachlamydeae 13.1 per cent are entered as SEW., while of the Monocotyledones and Archichlamydeae respectively 6.6 per cent. and 5.8 per cent. are so entered. The Archichlamydeae with 27.0 per cent. form, however, a larger portion of the total SEW. element than do the Monocotyledones with 22.0 per cent.

The two vertically distributed groups are somewhat more difficult to understand. The NSE. is in distinct preponderance over the NSW., having 13.6 per cent. of the total against 3.5 per cent. This is on account of the general eastern preponderance over western. Of the NSE. element the Metachlamydeae with 19.8 per cent. are behind the Monocotyledones with 36.6 per cent. and the Archichlamydeae with 40.9 per cent. Of the NSW. element, the Metachlamydeae are ahead with 48.7 per cent. against 38.4 per cent. of Archichlamydeae and 12.8 per cent. of Monocotyledones. This difference between the two vertical elements is probably to be referred to the lateral influence of the mountain ranges east and west of the Minnesota valley and to the angle made by the two principal continental trenches—the Mississippi valley and the the lake-region valley of Canada and the boundary. It has been easier for Metachlamydeae to move north and south in the *western* part of the continent, for the general movement has been from the south to the north; it has been easier for Monocotyledones to move south and north, in the *eastern* part

of the continent, for the general movement has been both north and south and the lake-region trench with the Appalachian system has favored their movements in the east rather than the west. Between Monocotyledones and Archichlamydeae on the one hand and Metachlamydeae on the other, the topography of the continent, considering the points of greatest distinctive pressure for each group, would seem, perhaps, to tend towards the establishment of a general diagonal tension-line running in a direction north-west by south-east. On the south and west the upward movement of north-bound plants would be easier than on the north and east, while on the north and east the downward movement of south-bound plants would be easier than on the south and west. Under such conditions the preponderance of the Metachlamydeae—which are distinctively central and north-bound—would be rather to the west than to the east, while the preponderance of Archichlamydeae—which are distinctively distal and south bound—would be rather to the east than to the west. In the Monocotyledones, since they are the most generally distributed, if this were a just explanation, we should expect to find such a difference strongly marked and such is actually the case, for of the NSE. element the Monocotyledones form 36.6 per cent. while of the NSW. element they form but 12.8 per cent. Evidently in the regions of the secondary longitudinal tensions their percentages would vary to the extent of complete reversal, in many cases. It is only in a region comparatively uninfluenced by longitudinal tensions that the diagonal tension could be recognised.

Whether or not the above paragraph indicates the true explanation of the different composition of the NSE. and NSW. range-elements, it is an interesting fact to note that in this central basin of the continent the NSE. species are preponderantly Monocotyledones and Archichlamydeae while the NSW. species are preponderantly Metachlamydeae.

The NSEW. element with its preponderance of Monocotyledones and slight representation of Metachlamydeae, offers no difficulties. By it, a further indication of the general ranges of Monocotyledones, as a group, and the special ranges of Metachlamydeae, as a group, is given. As in other similar cases the Archichlamydeae are seen to occupy the intermediate position.

The four binary elements, NE., NW., SE., SW., are similarly simple of explanation, with the exception, possibly of the NW. element. In the NE. element the Monocotyle-

donees are preponderant and the Archichlamydeae intermediate. In both the SE. and SW. elements the Metachlamydeae are preponderant and the Archichlamydeae intermediate. These facts are seen to be exactly in line with the rest that have been given. In the NW. element which is numerically the smallest of all the combination elements, the Archichlamydeae are preponderant while the Monocotyledones and Metachlamydeae; for their respective numbers, contribute about equally to the element. This is probably to be attributed to two facts. First, the Siberian and the N. W. T. influence would be felt most strongly in the NW. element and this influence would consist principally of monocotyledonous and archichlamydeous forms. Second, the Monocotyledones of this influence would be generally more widely distributed in North America than the Archichlamydeae, so that they would be probably entered either in the NEW. or NSEW. elements. The Metachlamydeae then through their endemic and north-bound characteristics and the Monocotyledones through their general and south or north-bound characteristics have either failed, on the one hand to make the N. W. range or, on the other have ranged beyond and are in the more general categories. The intermediate condition of the Archichlamydeae is then, after all, the cause of their preponderance in the NW. element. Apparently, too, if the existence of the diagonal tension, discussed above, were borne out by further examination it would be possible for such a condition to appear in no other element than the NW. For in the NE. the Monocotyledones would have their greater ease of distribution to increase their preponderance while in the SE. and SW. the Metachlamydeae would in varying ratios predominate.

In general, then, the combination elements serve to add to the weight of evidence in favor of considering the Metachlamydeae, Archichlamydeae and Monocotyledones of different and more or less definite meaning as components. The two special cases are the NSW. and the NW. and an attempt, probably imperfect although, it is hoped, suggestive, has been made to show how in their case special topographical or geographical conditions have served to modify the more general biological conditions.

Of the 1.174 species and varieties considered as indigenous to the Minnesota valley, 317 are of extracontinental range. This number is quite exclusive of the 130 species and varieties which have been introduced into the Minnesota valley during

the last fifty years, by the agency of man. It is intended also to be exclusive of such North American species as have been distributed abroad by other than the so-called agencies of nature. The group of 317 species and varieties may be known as the Extra-Continental specific element and may be isolated for examination. In the following list the countries of extra-continental distribution are noted for each species, and preceding each entry are given the letters which indicate the intra-continental range of the species. The list is herewith appended:

E. List of Species and Varieties of Minnesota Valley Metas-permae which are of Extra-Continental Range.

Monocotyledones.

- nsew.* Typha latifolia. EUR., ASIA, N. AFRICA.
- new.* Sparganium simplex. EUR., SIB.
- nsew.* Potamogeton natans. EUR., AS., AUST., AFR.
- nsew.* Potamogeton fluitans. EUR., AS., AUST., AFR., S. AMER.
- nse.* Potamogeton perfoliatus. EUR., AS., AFR., AUST.
- new.* Potamogeton heterophyllos. EUR., AS.
- nse.* Potamogeton gramineus var. zizii. EUR., AS.
- nsew.* Potamogeton pusillus. EUR., AFR., AS., S. AMER.
- new.* Potamogeton rutilus. EUR., AS., AFR.
- nsew.* Potamogeton pectinatus. EUR., AS., AUST.
- nsew.* Potamogeton lucens. EUR., AS., AFR., AUST., W. INDIES.
- new.* Potamogeton praelongus. EUR.
- nsew.* Potamogeton lanceolatus. EUR.
- new.* Potamogeton zosteræfolius. EUR., AS.
- nsew.* ZanicHELLIA palustris. EUR., AS., AFR., PHILLIPINES, AUST.
- nsew.* Najas flexilis. EUR., AS., W. INDIES.
- new.* Triglochin palustris. EUR., AS., AFR., S. AMER.
- new.* Triglochin maritima. EUR., AS. AFR.
- new.* Scheuchzeria palustris. EUR., AS.
- new.* Alisma plantago. EUR., AS., AUST. AFR.
- new.* Sagittaria sagittæfolia. EUR., AS.
- nsew.* Elodea canadensis. EUR., AS.
- se.* Vallisneria spiralis. EUR., AS., AUST.
- se.* Andropogon provincialis. FRANCE.
- sew.* Cenchrus tribuloides. AFR., E. AND W. INDIES.
- se.* Zizania aquatica. SIB., JAPAN.
- nsew.* Homalocenchrus oryzoides. EUR., AS., AFR.
- new.* Phalaris arundinacea. EUR., AS.
- new.* Hierochloë odorata var. fragrans. EUR., AS.
- se.* Muhlenbergia sobolifera. EUR.
- nsew.* Agrostis hiemalis. AS.
- nsew.* Agrostis perennans. AS.?
- nw.* Deyeuxia neglecta. EUR., AS.
- new.* Deyeuxia canadensis. SIB.

- new.* *Deschampsia caespitosa.* EUR., AS., AUST., AFR., S. AMER.
new. *Bouteloua curtipendula.* PERU.
nw. *Beckmannia erucaeformis.* EUR., SIB.
nsew. *Phragmites phragmites.* EUR., AS., AFR., AUST., S. AMER.
sew. *Eragrostis eragrostis.* EUR., AS., AFR., AUST., S. AMER.
se. *Eragrostis hypnoides.* W. IND., S. AMER.
new. *Koeleria cristata.* EUR., AS.
new. *Poa nemoralis.* EUR., AS.
new. *Poa palustris.* EUR., AFR., AS.
nw. *Poa compressa.* EUR., SIB.
nw. *Scolochloa arundinacea.* EUR., SIB.
new. *Panicularia fluitans.* EUR., AS., AFR., AUST.
nsew. *Festuca ovina.* EUR., AS., AUST., S. AMER., AFR.
se. *Bromus purgans.* S. AMER.?, AS.
nsew. *Agropyrum caninum.* EUR., SIB.
ne. *Agropyrum violaceum.* EUR
new. *Agropyrum glaucum.* EUR., AS.
nsw. *Hordeum nodosum.* EUR., AS., AFR., AUST., S. AMER.
nw. *Hordeum jubatum.* EUR., SIB.
sew. *Hemicarpha micrantha.* BRAZIL.
sew. *Cyperus esculentus.* EUR., AS., AFR., AUST.
sew. *Cyperus aristatus.* AFR., E. INDIES.
new. *Eriophorum gracile.* EUR., SIB.
new. *Eriophorum polystachion.* EUR., AS.
new. *Eriophorum vaginatum.* EUR., AS.
nsew. *Scirpus lacustris.* EUR., AS., AUST., SANDWICH ISLS.
nsew. *Scirpus triangularis.* EUR., AUST., S. AMER., W. INDIES.
nsew. *Heleocharis acicularis.* EUR., AS.
nsew. *Heleocharis palustris.* EUR., AS., AFR., MALAY ARCH., AUSTR.
nsew. *Heleocharis ovata.* EUR., AS.
sew. *Iria capillaris.* TROPICS.
nsew. *Rhynchospora alba.* EUR., AS.
new. *Carex siccata.* AS.
ne. *Carex tenuiflora.* EUR., AS.
new. *Carex canescens.* EUR., AS., CHILE.
new. *Carex tenella.* EUR.
new. *Carex sartwellii.* AS.
new. *Carex teretiuscula.* EUR., AS., N. ZEAL.
nsw. *Carex stenophylla.* EUR.
ne. *Carex chordorhiza.* EUR., AS.
new. *Carex limosa.* EUR., AS.
new. *Carex magellanica.* EUR., S. AMER.
new. *Carex aquatilis.* EUR.
nsew. *Carex fusca.* EUR., AS., AUST.
nse. *Carex riparia.* EUR., AS., AFR., S. AMER.
new. *Carex filiformis.* EUR., AS.
ne. *Carex pseudocyperus.* EUR., AS., AFR., AUST.
ne. *Carex pauciflora.* EUR.
nse. *Acorus calamus.* EUR., AS., CHINA, JAPAN.
ne. *Spathyema foetida.* JAPAN, AMURLAND.
ne. *Calla palustris.* EUR., AS.
nsew. *Lemna minor.* EUR., AS., AFR., AUST., S. AMER.

- nsew.* *Lemna trisulca.* EUR., AS., AUST., AFR., S. AMER.
nsew. *Lemna polyrrhiza.* EUR., AS., AUST., W. INDIES.
se. *Grantia braziliensis.* BRAZIL.
ne. *Eriocaulon septangulare.* IRELAND, SKYE, HEBRIDES.
sew. *Heteranthera dubia.* CUBA.
nsew. *Juncus tenuis.* EUR., N. ZEAL., TRISTAN D'ACHUNA.
ne. *Juncus balticus.* S. AMER., PATAGONIA, SPAIN.
new. *Juncus filiformis.* EUR., AS., PATAGONIA.
nsew. *Juncus effusus.* EUR., AS., AFR., AUST., S. AMER.
new. *Juncus nodosus.* AS.?
nse. *Juncus canadensis* var. *longicaudatus.* S. AMER.
nsew. *Cyperella campestris.* EUR., AS., N. AFR., N. ZEAL.
new. *Tofieldia glutinosa.* N. AS.
new. *Veratrum viride.* SIB.
new. *Allium schoenoprasum.* EUR., SIB., JAPAN, HIMALAYAS.
new. *Unifolium bifolium.* EUR., AS.
new. *Unifolium trifolium.* AS.
new. *Unifolium stellatum.* NORWAY.
se. *Smilax rotundifolia.* W. INDIES.
se. *Smilax herbacea.* JAPAN.
nse. *Sisyrinchium angustifolium.* EUR.
new. *Habenaria dilatata.* N. AS., N. EUR.
new. *Habenaria hyperborea.* ICELAND.
new. *Habenaria bracteata.* ASIA.
nse. *Pogonia ophioglossoides.* JAPAN.?
new. *Gyrostachys romanzowiana.* EUR., AS.
new. *Peramium repens.* N. EUR., N. AS.
nse. *Achroanthos unifolia.* RUSSIA.?
ne. *Leptorchis loeseli.* EUR., AS.
new. *Corallorrhiza corallorrhiza.* N. EUR., N. AS.

Archichlamydeae.

- se.* *Juglans nigra.* S. AMER.
new. *Salix myrtilloides.* EUR., AS.
new. *Salix longifolia.* ASIA.?
se. *Ostrya ostrya.* JAPAN.
new. *Corylus rostrata.* N. E. ASIA.
new. *Alnus incana.* N. EUR., N. AS.
new. *Rumex salicifolius.* N. AS.
nsew. *Rumex persicarioides.* EUR., AS.?
new. *Polygonum hydropiper.* EUR., AS.
se. *Polygonum hydropiperoides.* S. AMER., AUST.
nsew. *Polygonum amphibium.* EUR., AS., S. AFR., JAPAN
nsew. *Polygonum incarnatum.* EUR., AS.
sew. *Polygonum erectum.* EUR., AS.
nse. *Polygonum aviculare.* EUR., AS., JAPAN.
sew. *Polygonum scandens.* EUR., AS.
nse. *Polygonum arifolium.* AS.?
se. *Polygonum sagittatum.* AS.
new. *Chenopodium rubrum.* EUR.
nsew. *Chenopodium capitatum.* EUR., AS.
new. *Corispermum hyssopifolium.* EUR., AS., MANCH., CHINA.

- nse.* *Salsola kali*. EUR., AS., AFR., AUST., S. AMER.
se. *Phytolacca decandra*. EUR., CHINA.[?]
new. *Stellularia crassifolia*. N. EUR., N. AS.
new. *Stellularia longipes*. CIRCUMPOLAR, EUR., AS.
new. *Stellularia longifolia*. N. AS., MANCH., EUR.
new. *Cerastium arvense*. EUR., N. AFR., AS., S. AMER., PATAGONIA.
ne. *Cerastium arvense* var. *bracteatum*. AMURLAND, SIB.[?]
new. *Moehringia lateriflora*. EUR., N. AS.
se. *Nelumbo nelumbo*. W. INDIES, S. AMER.
sew. *Brasenia peltata*. JAPAN, E. INDIA, TROP. AFR., AUST., CUBA.
nsew. *Nymphaea advena*. E. SIB.[?]
sew. *Ceratophyllum demusum*. EUR., AS., JAPAN.
new. *Caltha palustris*. EUR., AS., CHINA.
new. *Isopyrum trifolium*. ICELAND, N. ASIA, JAPAN.
se. *Isopyrum biternatum*. KAMTSCHATKA.
new.? *Actaea rubra*. EUR., AS., CHINA.
sew. *Aquilegia canadensis*. N. E. SIB.[?]
nse. *Anemone hepatica*. EUR., AS., CHINA.
new. *Anemone quinquefolia*. N. AS., CHINA.
new. *Anemone dichotoma*. EUR., SIB.
new. *Anemone multifida*. CHILE, MAGELLAN.
nw. *Anemone parviflora*. E. SIB.
ne. *Anemone hirsutissima*. E. SIB.[?]
new. *Oxygraphis cymbalaria*. EUR., AS., CHINA.
new. *Ranunculus pennsylvanicus*. CHINA.
nw. *Ranunculus repens*. N. EUR., N. AS., N. AFR.
nsew. *Ranunculus septentrionalis*. EUR., AS.
nse. *Ranunculus recurvatus*. N. E. SIB.
nsew. *Ranunculus sceleratus*. N. EUR., AS., CHINA.
new. *Ranunculus pedatifidus*. EUR., AS.
new. *Ranunculus reptans*. N. EUR., SIB.
new. *Ranunculus ambigens*. EUR.[?]
new. *Ranunculus lacustris*. SIB.
nsew. *Ranunculus aquatilis* var. *trichophyllos*. EUR., AS., AUST., AFR.
new. *Ranunculus circinnatus*. EUR.
se. *Podophyllum peltatum*. JAPAN.
nse. *Leontice thalictroides*. JAPAN, MANCHURIA.
ne. *Capnorchis cucullaria*. KAMTSK.[?]
nsew. *Neckeria aurea*. AMURLAND.
new. *Neckeria sempervirens*. SIB., KAMTSK.
nw. *Barbarea barbarea* var. *stricta*. EUR., AS., CHINA.
nsew. *Nasturtium hispidum*. SIB.[?]
nsew. *Nasturtium palustre*. EUR. N. AFR., AS.
nsew. *Cardamine parviflora*. N. EUR., N. AS.
nsew. *Cardamine hirsuta*. N. EUR., N. AS., CHINA.
nw. *Draba nemorosa*. N. EUR., N. AS., CHINA.
se. *Draba verna*. S. EUR., RUSSIA.
new. *Arabis lyrata*. JAPAN, KURILES.
nw. *Arabis glabra*. N. EUR., AS.
new. *Arabis hirsuta*. EUR., AS.

- nsew.* *Erysimum cheiranthoides*. N. EUR., N. AS., N. AFR.
new. *Drosera intermedia*. EUR., AS., S. AMER.
new. *Drosera rotundifolia*. EUR., AS.
se. *Penthorum sedoides*. MANCH., JAPAN, CHINA.
nse. *Tiarella cordifolia*. N. W. ASIA, BAIKAL SIB.
new. *Mitella nuda*. SIB., AMURLAND.
nsew. *Mitella diphylla*. E. SIB.?
new. *Parnassia palustris*. EUR., AS.
new. *Ribes rubrum*. EUR., AS.
nse. *Ribes floridum*. ANDES, S. AMER.
new. *Spiraea salicifolia*. EUR., AS., CHINA.
new. *Pirus sambucifolia*. EUR., ASIA., JAPAN.
new. *Rubus strigosus*. EUR., AS., JAPAN, N. AFR.?
new. *Fragaria vesca*. EUR., AS.
new. *Potentilla anserina*. N. EUR., AS., CHINA, AUST., S. AMER.
new. *Potentilla fruticosa*. N. EUR., AS., CHINA, JAPAN.
new. *Potentilla palustris*. EUR., AS.
nse. *Potentilla argentea*. EUR., AS.
new. *Potentilla sylvanica*. SIB., JAPAN.
se. *Potentilla supina*. EUR., AS., CHINA, S. AMER.
nse. *Potentilla norvegica*. EUR., AS.
nse. *Geum rivale*. EUR., AS., AUST., S. AMER.
new. *Geum strictum*. EUR., AS., JAPAN, N. ZEAL., S. AMER.
new. *Geum japonicum*. E. AS., JAPAN.
nsew. *Agrimonia eupatoria*. EUR., AS., N. AFR., S. AFR.
nw. *Rosa acicularis*. N. EUR., AS., CHINA.
se. *Cerasus serotina*. S. AMER., ANDES.
nsew. *Lathyrus palustris*. EUR., N. AS., CHINA.
ne. *Vicia cracca*. EUR., AS., CHINA, N. AFR.
nw. *Astragalus hypoglottis*. SIB., KAMTSK.
nw. *Astragalus adsurgens*. SIB., KAMTSK.
nse. *Geranium maculatum*. SIB.
sew. *Oxalis stricta*. N. EUR., N. AS., CHINA.
nsew. *Stellaria verna*. EUR., AS., S. AMER.
se. *Rhus radicans*. N. E. AS., JAPAN.
nse. *Hypericum ascyron*. SIB., CHINA.
new. *Viola sylvestris*. EUR., SIB., CHINA.
new. *Viola canadensis*. N. E. ASIA.
nw. *Viola pubescens*. N. E. ASIA.
ne. *Viola rotundifolia*. KAMTSK.?
new. *Viola blanda*. KAMTSK.
nsew. *Isnardia palustris*. EUR., S. AFR., W. AS.
new. *Epilobium hornemanni*. EUR., AS.
new. *Epilobium palustre*. EUR., AS.
new. *Epilobium lineare*. N. EUR., N. AS.
nsew. *Epilobium angustifolium*. EUR., AS., JAPAN.
new. *Circaea alpina*. EUR., AS., CHINA, N. AFR.
nse. *Circaea lutetiana*. EUR., AS., CHINA, N. AFR.
nsew. *Hippuris vulgaris*. EUR., AS., AFR., AUSTR., S. AMER.
se. *Myriophyllum verticillatum*. EUR., AS., CHINA, N. AFR.
nse. *Myriophyllum spicatum*. EUR., AS., CHINA, N. AFR.
nse. *Aralia quinquefolia*. MANCH., JAPAN, COREA.

- nse.* *Aralia racemosa*. SAGHALIN, JAPAN.
nsew. *Heracleum lanatum*. AS., JAPAN.
sew. *Sium angustifolium*. EUR., SIB.
nsew. *Sium cicutaefolium*. EUR., SIB.
nse. *Deeringia canadensis*. CHINA, JAPAN.
sew. *Myrrhis claytoni*. JAPAN.
nse. *Myrrhis aristata*. JAPAN.
new. *Cornus canadensis*. MANCH., JAPAN.

Metachlamydeae.

- nsew.* *Pseva umbellata*. EUR., AS., JAPAN.
new. *Pirola secunda*. EUR., AS., JAPAN.
nsew. *Pirola elliptica*. JAPAN.
new. *Pirola rotundifolia*. EUR., AS., JAPAN.
nsew. *Monotropa uniflora*. AS., JAPAN, S. AMER.
new. *Andromeda polifolia*. EUR., AS.
new. *Lyonia calyculata*. EUR., AS.
new. *Chiogenes hispidula*. JAPAN.
new. *Arctostaphylos uva-ursi*. N. EUR., N. AS., JAPAN.
new. *Oxycoccus macrocarpus*. KURILES?
new. *Oxycoccus oxycoccus*. EUR., AS., JAPAN.
new. *Lysimachia thyrsiflora*. EUR., JAPAN.
sew. *Centunculus minimus*. EUR., AS., AUST., BRAZIL, ANDES,
 CHILE.
new. *Menyanthes trifoliata*. N. EUR., N. AS., JAPAN.
new. *Gentiana serrata*. EUR., AS., CHINA.
se. *Asclepias syriaca*. EUR., AS.
new. *Volvulus sepium*. EUR., AS., AUST., N. ZEAL., N. AFR.,
 CHINA.
sew. *Cuscuta arvensis*. S. AMER.
se. *Myosotis arvensis*. EUR., AS., N. AFR.
nsw. *Lappula redowskii*. AS.
se. *Leptostachya leptostachya*. E. SIB., JAP., INDIA.
se. *Stachys aspera*. JAPAN, KAMTSK.
nsew. *Stachys palustris*. EUR., AS.
nsew. *Brunella vulgaris*. EUR., AS., N. AFR., AUST., S. AMER.
new. *Scutellaria galericulata*. EUR., AS., JAPAN, N. AFR.
new. *Acinos vulgaris*. EUR., AS., JAPAN.?
nsw. *Lycopus lucidus*. JAPAN, SIB.
se. *Teucrium canadense*. SIB.?
sew. *Physalis pubescens*. CHINA, BRAZIL, BARBADOES.
se. *Physalis angulata*. S. AMER., AFRICA.
nsew. *Solanum nigrum*. EUR., AS., AFR., AUST., S. AMER.
sew. *Scrophularia nodosa*. EUR., SIB.
se. *Mimulus ringens*. KURILES.
nsew. *Veronica peregrina*. EUR., AS., JAPAN, ANDES, S. AMER.
new. *Veronica scutellata*. EUR., AS., N. AFR.
new. *Veronica anagallis*. EUR., AS., CHINA, N. AFR., S. AMER.
se. *Veronica virginica*. JAPAN, SIB.
new. *Castilleja pallida*. EUR., SIB.
se. *Utricularia cornuta*. CUBA, BRAZIL.
new. *Utricularia intermedia*. EUR., AS., JAPAN.

- new.* *Utricularia minor.* EUR., AS., N. AFR.
nsew. *Utricularia vulgaris.* EUR., AS., N. AFR.
sew. *Plantago major.* EUR., AS., CHINA?, N. AFR.
nsew. *Galium triflorum.* EUR., AS., JAPAN.
nse. *Galium asprellum.* AS., JAPAN.
nsew. *Galium trillidum.* EUR., AS., JAPAN.
new. *Galium boreale.* EUR., AS., CHINA.
nsew. *Galium aparine.* EUR., AS., JAPAN.
new. *Linnaea borealis.* EUR., AS., JAPAN.
new. *Sambucus racemosus.* EUR., AS., JAPAN.
new. *Viburnum opulus.* EUR., AS., JAPAN.
new. *Adoxa moschatellina.* EUR., AS., CHINA.
se. *Sicyos angulatus.* S. EUR., S. AS.
nsew. *Campanula rotundifolia.* EUR., AS., JAPAN.
sew. *Pentagonia perfoliata.* CHILE, S. AMER.
nsew. *Erigeron canadensis.* EUR., AS., CHINA, S. AFR.?
new. *Anaphalis margaritacea.* EUR.?, N. AS., JAPAN, CEYLON.
new. *Gnaphalium uliginosum.* EUR., AS., CHINA.
nw. *Adenocaulon bicolor.* JAPAN, HIMALAYAS.
nse. *Ambrosia artemisiaefolia.* BRAZIL, W. INDIES.
nse. *Xanthium canadense* var. *echinatum.* S. AMER., CHILE.
nsew. *Bidens cernua.* EUR., AS., CHINA.
nsew. *Achillea millefolium.* EUR., AS., N. AFR., AUST., AZORES.
nsw. *Artemisia frigida.* ASIA.
new. *Artemisia biennis.* KAMTSK., N. INDIA.
nsew. *Artemisia canadensis.* N. W. ASIA.
se. *Erechtites hieracifolia.* S. AMER., W. INDIES.
nsw. *Senecio lugens.* N. AS., N. EUR.
new. *Senecio palustris.* N. EUR., N. AS.
nsew. *Taraxacum taraxacum.* EUR., AS., CHINA, S. AMER.,
AUST., AFR.
new. *Hieracium canadense.* N. EUR.

From the list the following tables may be compiled:

| 29. The Extra-Continental Specific Element. | | | |
|---|-----------------|------------------------|--------------------------|
| | No. of species. | Per cent. of all E. C. | E. C. per cent. of each. |
| Monocotyledones..... | 116 | 36.5 | 34.7 |
| Archichlamydeae..... | 130 | 41.0 | 28.3 |
| Metachlamydeae..... | 71 | 22.5 | 18.6 |
| Total Extra-Continental.... | 317 | | |
| E. C. per cent. of all species... | 27.0 | | |

30. Distribution of Extra-Continental Species.

| | Monocotyledones. | Archichlamydeae. | Metachlamydeae. | Total. | Per cent. of Extra-Continental. |
|-----------------------------|------------------|------------------|-----------------|--------|---------------------------------|
| Europe | 89 | 78 | 46 | 213 | 67.1 |
| Asia | 88 | 121 | 63 | 272 | 85.7 |
| Manchuria, Japan, China.... | 6 | 54 | 40 | 100 | 31.5 |
| Africa | 28 | 17 | 14 | 59 | 15.4 |
| Australasia..... | 28 | 8 | 6 | 42 | 13.2 |
| West Indies..... | 8 | 1 | 4 | 13 | 4.1 |
| South America... .. | 22 | 15 | 14 | 51 | 16.0 |

31. Intra-Continental Distribution of Extra-Continental Specific Element.

| | N. | S. | E. | W. | Not N. | Not E. |
|----------------------|------|------|------|------|--------|--------|
| Monocotyledones | 86.2 | 47.4 | 93.9 | 76.7 | 13.8 | 6.1 |
| Archichlamydeae.... | 83.1 | 50.0 | 93.0 | 70.7 | 16.9 | 7.0 |
| Metachlamydeae | 76.1 | 57.7 | 92.9 | 80.2 | 23.9 | 7.1 |
| Total element | 85.9 | 50.7 | 93.3 | 75.4 | 14.1 | 6.7 |

In the first table there appears in the third column of figures a further verification of the statements previously advanced regarding the relative extent of distribution of the Monocotyledones, as a group, and of the Metachlamydeae. While 34.7 per cent. of all monocotyledonous species are of extra-continental range, 28.3 per cent. of the Archichlamydeae, and but 18.6 per cent. of the Metachlamydeae are of such range. The Archichlamydeae, from their absolute numerical preponderance, form the largest percentage of the extra continental element. The Metachlamydeae, both absolutely and according to their number, form the smallest percentage. A comparison with the table which gives the general taxonomic-group percentages of the total valley species will be instructive. While the Monocotyledones form 28.4 per cent. of the total species they

form 36.5 per cent. of the extra-continental species; while the Archichlamydeae form 31.9 per cent. of the total species they form 41.0 per cent. of the extra-continental element, and while the Metachlamydeae form 32.3 per cent. of the total flora, they form but 22.5 per cent. of the extra-continental element. This element shows, when compared with the general flora, a falling off in Metachlamydeae and a concurrent increase of Monocotyledones and Archichlamydeae. The increase is greatest among the Monocotyledones.

In the second of the last three tables the distribution by countries of the extra-continental element is indicated. The percentages are fairly exact except in the case of the West Indies. Of this region access has been had only to Grisebach's *Flora of the British West Indies*. The percentage is probably somewhat too small, but would in any event be likely to be the smallest of the series. It is seen that the extra-continental element is preponderantly Asiatic, and of the Asiatic group the Manchurian-Japanese forms a considerable percentage. Subtracting this percentage from the total Asiatic percentage gives 54.2 per cent. as the approximate Siberian element. This division of the Asiatic element is a proper one and the two groups of extra-continental species thus isolated would be interesting in detailed comparison. Such comparison would, however, be a little removed from the purpose of the chapter. A glance at the table will show several curious facts that may be noted. The Siberian group furnishes a larger percentage of Monocotyledones and smaller percentage of Metachlamydeae, comparatively, than the Japanese-Manchurian. The African element is almost as large as the South American or Australasian, and for the most part consists of the same plants. In all three the preponderant taxonomic group is the Monocotyledones, and of these it is especially the aquatic or marsh forms that are thus widely distributed. In these three distant elements the monocotyledonous percentage is somewhat in advance of such general percentages of the whole extra-continental element. Especially in the most distant element, the Australasian, are the Monocotyledones predominant. Of this element they form 66.6 per cent. Of the European element the Monocotyledones form a larger percentage than of the Asiatic, while of the Asiatic element the Archichlamydeae and Metachlamydeae form each a larger percentage than of the European. Of the Manchurian-Japanese element the Archichlamydeae and Metachlamydeae each form a larger percentage than of the Siberian or total Asiatic.

The third table of the series showing the North American range of extra-continental Minnesota valley metaspermic species and varieties presents some interesting percentages. Of the total element 85.9 per cent are northern and 50.7 per cent southern in North America. Comparing with the general tables of the entire flora, we find that 55.6 per cent of the species are northern while 76.1 per cent are southern. This indicates the predominant northern character of the extra-continental specific element. Its presence in the Minnesota valley is therefore principally to be referred to the influence of the Conifer region of Engler or the Northern of Drude, which lies just above the latitude of the Minnesota valley. Of the extra-continental element 93.3 per cent. is eastern and 75.4 per cent. western. Comparing again the tables for the entire metaspermic flora we find that 87.2 per cent. are eastern and 51.4 per cent. western. The difference between the general percentages is therefore greater than between the extra-continental percentages. This indicates a more general latitudinal distribution of extra-continentally ranging species than of the average species of the valley. Since, however, this extra-continental element is so preponderantly northern the longitudinal distribution is not equal to the average longitudinal distribution. The extra-continental element is therefore distinctively lateral rather than vertical in its characteristic inter-continental distribution.

Besides the comparison of totals, the comparative distribution of the three taxonomic groups will be worth a moment's attention. Of the total specific elements the Monocotyledones run 68.2 per cent. northern, 69.1 per cent. southern, 93.6 per cent. eastern, 53.1 per cent. western. Of the extra-continental element the Monocotyledones run 86.2 per cent. northern, 47.4 per cent. southern, 93.9 per cent. eastern, 76.7 per cent. western. These figures indicate for the extra-continental Monocotyledones an increase in average northernness and a decrease in average longitudinal equality of distribution, together with an increase of lateral equality of distribution.

Of the total specific elements the Archichlamydeae run 55.9 per cent. northern, 75.1 per cent. southern, 86.1 per cent. eastern, 49.6 per cent. western. Of the extra-continental specific element the Archichlamydeae run 83.1 per cent. northern, 50.0 per cent. southern, 93.0 per cent. eastern, 70.7 per cent. western. These figures preserve an exact parallelism with those of the Monocotyledones, but with varying internal ratios. The

east and west distribution of the Monocotyledones of the extra-continental element indicated by the figures 93.9 and 76.7 is more even than that of the Archichlamydeae of that element, indicated by the figures 93.0 and 70.7. On the other hand the north and south distribution of the Archichlamydeae of the extra-continental element is more even than that of the Monocotyledones, as indicated respectively, by the relations between the figures 83.1—50.0 and 86.2—47.4. But in comparison with the general specific elements we see, as for the Monocotyledones, an increase in average northernness, a decrease in average longitudinal equality of distribution and an increase of lateral equality.

Of the total specific elements the Metachlamydeae run 41.6 per cent. northern, 83.9 per cent. southern, 82.9 per cent. eastern, 51.9 per cent. western. Of the extra-continental element they run 76.1 per cent. northern, 57.7 per cent. southern, 92.9 per cent. eastern and 80.2 per cent. western. Of the three taxonomic groups, then, the Metachlamydeae show the greatest evenness of longitudinal distribution. In other words, this group is least concerned in the northern-region influence. Further the Metachlamydeae are most evenly distributed east and west, of the extra-continental groups. As before, however, but with diminished ratios, the Metachlamydeae, in comparison with the Metachlamydeae of the total specific elements, show an increase in average northernness, a decrease in average longitudinal equality of distribution, an increase in average lateral equality of distribution. These three indices of extra-continental ranging in its relation to intra continental distribution reduce themselves to this: The extra-continental element is more widely distributed intra-continentially than the general intra-continental element. It is more evenly distributed laterally and less evenly distributed longitudinally. The three taxonomic groups are in any case of different value in relative cosmopolitan or endemic distribution. These differences persist and are accentuated in the extra-continental element. Since the endemic character is at once preponderantly metachlamydeous and also of the Central element, it happens that the longitudinal distribution of extra-continental Metachlamydeae is more even than that of the other two groups, for the general southern and specific northern influences are best able in this group to neutralise each other.

From the above condensed account of the extra-continental specific element it will be seen that every figure, in comparison

or alone, is able to cast some additional light on the general problems of metaspermic history. Many other comparisons might be made and some of them would prove of definite value, but enough has already been brought forward to lay the foundation of our understanding of the relations between the extra-continental element in its outside and inside ranging and in its connection with the general flora.

The combination-ranges have not been worked out for the extra-continental element, but one or two facts are evident from the general survey of table E. For example the SE. range is particularly noticeable in the Manchurian-Japanese element and the NEW. range, in the Siberian or European element. The SW. range is not unprevalent in the South American element. The wider extra-continental ranges are generally coördinate with the wider intra-continental ranges, and *vice versa*. The explanation of the SE. preponderant-range of the Japanese-Manchurian element has been given as follows: The North American species which are found also in Japan, Manchuria and China were originally northwest in their American distribution. During the glacial period they were forced southeast along the lake-region trench of Canada and the boundary, thus reaching the Atlantic coast in the vicinity of New York or Delaware. Those which were pushed more directly south or west were destroyed through their inability to acclimate themselves at constantly higher altitudes. Only those which moved down the trench, and consequently southeast, were able to survive. The plants across Berings Straits were similarly induced to move southward into the unglaciated island of Japan, or into China and the Amur. There was thus brought about a division of the original northwest element in such a way that part of it became southeastern in North America and the rest eastern or north eastern in Asia. The relation between the Japanese-Manchurian region and the eastern North American is therefore to be explained from Tertiary and post-Tertiary wanderings, from glacial dispersions and from topographical peculiarities of the two continents concerned. All this has been ably discussed by Gray, Miquel, Nathorst, Saporta, Engler, Heer and others.

A general table of range may now be presented; it is compiled from Table D. and gives the number of species in each family that range north, east, south and west, and the total number of species in each family. This table will serve as a termination of this line of statistical enquiry and following it the physiognomic elements will briefly be examined.

F. Table Illustrating the Range of Minnesota Valley Metaspermae, by Families and Species.

| | North | South | East | West | Total |
|-------------------------|-------|-------|------|------|-------|
| Monocotyledones. | | | | | |
| Typhaceae..... | 1 | 1 | 1 | 1 | 1 |
| Sparganiaceae..... | 3 | 2 | 3 | 2 | 3 |
| Potamogetonaceae..... | 15 | 11 | 16 | 13 | 16 |
| Najadaceae..... | 1 | 1 | 1 | 1 | 1 |
| Juncagineae..... | 3 | 0 | 3 | 3 | 3 |
| Alismaceae..... | 2 | 2 | 4 | 2 | 4 |
| Hydrocharitaceae..... | 1 | 2 | 2 | 1 | 2 |
| Gramineae..... | 48 | 66 | 71 | 58 | 89 |
| Cyperaceae..... | 89 | 80 | 116 | 63 | 118 |
| Aroideae..... | 4 | 2 | 4 | 0 | 4 |
| Lemnaceae..... | 4 | 6 | 6 | 2 | 6 |
| Xyridaceae..... | 0 | 1 | 1 | 0 | 1 |
| Eriocaulaceae..... | 1 | 0 | 1 | 0 | 1 |
| Commelinaceae..... | 0 | 1 | 1 | 0 | 1 |
| Pontederiaceae..... | 1 | 2 | 2 | 1 | 2 |
| Juncaceae..... | 9 | 6 | 11 | 5 | 11 |
| Liliaceae..... | 17 | 28 | 35 | 11 | 36 |
| Amaryllidaceae..... | 0 | 1 | 1 | 0 | 1 |
| Dioscoreaceae..... | 0 | 1 | 1 | 0 | 1 |
| Iridaceae..... | 2 | 3 | 3 | 0 | 3 |
| Orchidaceae..... | 29 | 16 | 30 | 13 | 30 |
| Archichlamydeae. | | | | | |
| Juglandaceae..... | 1 | 4 | 4 | 0 | 4 |
| Myricaceae..... | 1 | 1 | 1 | 0 | 1 |
| Salicaceae..... | 17 | 8 | 16 | 11 | 17 |
| Betulaceae..... | 5 | 4 | 8 | 3 | 8 |
| Fagaceae..... | 1 | 5 | 5 | 0 | 5 |
| Ulmaceae..... | 1 | 4 | 4 | 1 | 4 |
| Urticaceae..... | 2 | 4 | 5 | 1 | 5 |
| Moraceae..... | 1 | 2 | 2 | 1 | 2 |
| Santalaceae..... | 3 | 0 | 2 | 3 | 3 |
| Aristolochiaceae..... | 1 | 1 | 2 | 0 | 2 |
| Polygonaceae..... | 12 | 19 | 22 | 14 | 23 |
| Chenopodiaceae..... | 4 | 3 | 5 | 3 | 5 |
| Amarantaceae..... | 0 | 3 | 2 | 1 | 3 |
| Phytolaccaceae..... | 0 | 1 | 1 | 0 | 1 |
| Nyctaginaceae..... | 0 | 3 | 0 | 3 | 3 |
| Portulacaceae..... | 1 | 2 | 2 | 3 | 3 |
| Caryophyllaceae..... | 6 | 6 | 11 | 8 | 11 |
| Nymphaeaceae..... | 2 | 5 | 5 | 2 | 5 |
| Ceratophyllaceae..... | 0 | 1 | 1 | 1 | 1 |
| Ranunculaceae..... | 32 | 19 | 40 | 28 | 42 |
| Berberidaceae..... | 1 | 2 | 2 | 0 | 2 |
| Menispermaceae..... | 1 | 1 | 1 | 0 | 1 |
| Papaveraceae..... | 5 | 4 | 7 | 3 | 7 |
| Cruciferae..... | 18 | 23 | 21 | 20 | 30 |
| Capparidaceae..... | 0 | 2 | 2 | 2 | 2 |
| Sarraceniaceae..... | 1 | 0 | 1 | 1 | 1 |
| Droseraceae..... | 3 | 0 | 2 | 3 | 3 |
| Crassulaceae..... | 0 | 1 | 1 | 0 | 1 |
| Saxifragaceae..... | 9 | 9 | 14 | 8 | 14 |
| Rosaceae..... | 40 | 32 | 47 | 28 | 54 |
| Leguminosae..... | 17 | 51 | 37 | 26 | 55 |
| Geraniaceae..... | 2 | 2 | 2 | 1 | 2 |

F. Table Illustrating the Range of Minnesota Valley Metas-permae, by Families and Species.—Continued.

| | North | South | East | West | Total |
|-----------------------|-------|-------|------|------|-------|
| Oxalidaceae..... | 0 | 2 | 1 | 2 | 2 |
| Linaceae..... | 1 | 3 | 1 | 3 | 3 |
| Rutaceae..... | 1 | 2 | 2 | 0 | 2 |
| Polygalaceae..... | 2 | 6 | 6 | 1 | 6 |
| Euphorbiaceae..... | 2 | 11 | 4 | 8 | 11 |
| Stellariaceae..... | 1 | 1 | 1 | 1 | 1 |
| Anacardiaceae..... | 0 | 5 | 5 | 0 | 5 |
| Celastraceae..... | 1 | 2 | 2 | 0 | 2 |
| Aquifoliaceae..... | 1 | 1 | 1 | 0 | 1 |
| Staphyleaceae..... | 1 | 1 | 1 | 0 | 1 |
| Aceraceae..... | 3 | 6 | 7 | 1 | 7 |
| Balsaminaceae..... | 2 | 1 | 2 | 2 | 2 |
| Rhamnaceae..... | 1 | 2 | 3 | 1 | 3 |
| Vitaceae..... | 0 | 4 | 4 | 0 | 4 |
| Tiliaceae..... | 1 | 1 | 1 | 0 | 1 |
| Malvaceae..... | 0 | 4 | 3 | 1 | 4 |
| Hypericaceae..... | 3 | 7 | 7 | 0 | 7 |
| Cistaceae..... | 1 | 2 | 2 | 0 | 2 |
| Violaceae..... | 9 | 11 | 14 | 5 | 15 |
| Cactaceae..... | 0 | 3 | 1 | 2 | 3 |
| Thymelaeaceae..... | 0 | 1 | 1 | 0 | 1 |
| Elaeagnaceae..... | 2 | 1 | 1 | 1 | 2 |
| Lythraceae..... | 0 | 1 | 1 | 0 | 1 |
| Oenotheraceae..... | 12 | 11 | 13 | 12 | 17 |
| Halorrhagidaceae..... | 2 | 4 | 4 | 1 | 4 |
| Araliaceae..... | 5 | 4 | 5 | 1 | 5 |
| Umbelliferae..... | 11 | 20 | 21 | 10 | 22 |
| Cornaceae..... | 4 | 5 | 7 | 2 | 7 |
| Metachlamydeae. | | | | | |
| Pirolaceae..... | 7 | 4 | 8 | 7 | 8 |
| Ericaceae..... | 10 | 1 | 11 | 7 | 11 |
| Primulaceae..... | 4 | 6 | 7 | 4 | 8 |
| Oleaceae..... | 0 | 4 | 4 | 1 | 4 |
| Gentianaceae..... | 4 | 6 | 10 | 3 | 10 |
| Apocynaceae..... | 0 | 2 | 2 | 2 | 2 |
| Asclepiadaceae..... | 2 | 14 | 10 | 5 | 14 |
| Convolvulaceae..... | 1 | 8 | 8 | 5 | 9 |
| Polemoniaceae..... | 1 | 5 | 5 | 1 | 6 |
| Hydrophyllaceae..... | 2 | 4 | 4 | 2 | 4 |
| Borraginaceae..... | 2 | 12 | 9 | 5 | 12 |
| Verbenaceae..... | 1 | 6 | 4 | 4 | 6 |
| Labiatae..... | 12 | 18 | 21 | 13 | 24 |
| Solanaceae..... | 2 | 6 | 7 | 3 | 7 |
| Scrophulariaceae..... | 8 | 27 | 27 | 17 | 32 |
| Lentibulariaceae..... | 3 | 2 | 4 | 3 | 4 |
| Orobanchaceae..... | 0 | 3 | 2 | 3 | 3 |
| Plantaginaceae..... | 1 | 3 | 2 | 2 | 3 |
| Rubiaceae..... | 7 | 9 | 11 | 4 | 11 |
| Caprifoliaceae..... | 10 | 8 | 14 | 9 | 15 |
| Adoxaceae..... | 1 | 0 | 1 | 1 | 1 |
| Valerianaceae..... | 0 | 3 | 3 | 1 | 3 |
| Cucurbitaceae..... | 1 | 2 | 2 | 1 | 2 |
| Campanulaceae..... | 4 | 7 | 9 | 3 | 9 |
| Compositae..... | 66 | 158 | 131 | 92 | 173 |

IV. EXAMINATION OF PHYSIOGNOMIC CHARACTERS OF THE METASPERMIC PLANTS OF THE MINNESOTA VALLEY.

The plant-physiognomy of any district is determined by the habits and habitats of its plants. Without entering upon exhaustive analyses of the principal physiognomic groups—the forest and the prairie—it will be possible, nevertheless, to isolate three groups of species of characteristic habit and three others of characteristic habitat. The first three elements will then be as follows:

- A. The Arboreal element.
- B. The Shrubby element.
- C. The Herbaceous element.

Evidently transitional forms must be recognised between these groups, but in general a classification may be attempted of all species into one or another of the groups themselves. The character of a principal woody trunk is considered to indicate the tree, if this coexists with a sufficient size. The woody character without the principal trunk is deemed characteristic of the shrub, and the absence of a distinctly woody stem is considered characteristic of the herb. Of course all *Metaspermæ* contain woody tissue in greater or less abundance. If, however, the cambium cylinders are not developed, the plant is generally characterised as herbaceous.

Of the three habitat elements the classification may be as follows:

- A. The Aquatic element.
- B. The Swamp and Marsh element.
- C. The Drier-soil element.

As before, there are transitional forms between these groups and the entry of a given species may be difficult. Indeed in the same species certain individuals may be aquatic, and others may be found in more terrestrial localities. As in the case of the habit elements there is, then, some difficulty in obtaining a rigid classification. In the following tables two elements are unlisted—the herbaceous and the drier-soil elements. This is because these elements are in the nature of residua and may be understood closely enough from the other four elements that are listed. The following table gives a list of arboreal plants found growing spontaneously and indigenously in the valley of the Minnesota.

G. Table of Arboreal Metaspermae Indigenous to the Minnesota Valley.

Archichlamydeae.

| | |
|------------------------------------|--|
| <i>se.</i> Juglans nigra. | <i>se.</i> Pirus coronaria. |
| <i>nse.</i> Juglans cinerea. | <i>nw.</i> Amelanchier alnifolia. |
| <i>se.</i> Scoria minima. | <i>se.</i> Amelanchier canadensis. |
| <i>se.</i> Scoria ovata. | <i>nsew.</i> Amelanchier canadensis var. |
| <i>nsew.</i> Populus monilifera. | obovalis. |
| <i>new.</i> Populus balsamifera. | <i>se.</i> Crataegus crus-galli. |
| <i>new.</i> Populus tremuloides. | <i>se.</i> Crataegus coccinea. |
| <i>nse.</i> Populus grandidentata. | <i>se.</i> Crataegus mollis. |
| <i>nsew.</i> Salix nigra. | <i>se.</i> Crataegus tomentosa. |
| <i>nsw.</i> Salix amygdaloides. | <i>se.</i> Prunus americana. |
| <i>se.</i> Carpinus caroliniana. | <i>se.</i> Cerasus serotina. |
| <i>se.</i> Ostrya ostrya. | <i>nsew.</i> Cerasus virginiana. |
| <i>se.</i> Betula nigra. | <i>new.</i> Cerasus pennsylvanica. |
| <i>new.</i> Betula papyrifera. | <i>se.</i> Gymnocladus dioicus. |
| <i>se.</i> Quercus velutina. | <i>se.</i> Rhus typhina. |
| <i>se.</i> Quercus rubra. | <i>sew.</i> Acer negundo. |
| <i>se.</i> Quercus muhlenbergii. | <i>se.</i> Acer rubrum. |
| <i>nse.</i> Quercus macrocarpa. | <i>nse.</i> Acer barbatum. |
| <i>se.</i> Quercus alba. | <i>se.</i> Acer barbatum var. nigrum. |
| <i>nse.</i> Ulmus racemosa. | <i>se.</i> Acer saccharinum. |
| <i>se.</i> Ulmus americana. | <i>ne.</i> Acer spicatum. |
| <i>se.</i> Ulmus fulva. | <i>nse.</i> Acer pennsylvanicum. |
| <i>sew.</i> Celtis occidentalis. | <i>nse.</i> Tilia americana. |
| <i>se.</i> Morus rubra. | <i>nse.</i> Cornus alternifolia. |
| <i>new.</i> Pirus sambucifolia. | |

Metachlamydeae.

| | |
|------------------------------------|-------------------------------|
| <i>sew.</i> Fraxinus sambucifolia. | <i>new.</i> Viburnum opulus. |
| <i>se.</i> Fraxinus pubescens. | <i>se.</i> Viburnum dentatum. |
| <i>se.</i> Fraxinus viridis. | <i>nse.</i> Viburnum lentago. |
| <i>se.</i> Fraxinus americana. | |

From the preceding table the following statistic tabulation is compiled:

| 32. The Arboreal Specific Element. | | | |
|------------------------------------|--------------------|-----------------------------------|----------------------------|
| | No. of species. | Per cent. of all arb. species. | Arb. per cent. of each. |
| Monocotyledones..... | 0 | 0 | 0 |
| Archichlamydeae | 48 | 86.7 | 10.0 |
| Metachlamydeae | 7 | 13.2 | 1.8 |
| Total Arboreal..... | 55 | | |
| Arb. per cent. of all species.. | 4.7 | | |

Succeeding the arboreal element must be noted the shrubby element. Of this, Table H presents the list.

H. Table of Shrubby Metaspermae Indigenous to the Minnesota Valley.

Monocotyledones.

se. *Smilax hispida.*

se. *Smilax rotundifolia.*

Archichlamydeae.

nse. *Myrica asplenifolia.*
new. *Salix myrtilloides.*
new. *Salix cordata.*
nse. *Salix cordata* var. *angustata.*
ne. *Salix candida.*
new. *Salix petiolaris.*
nse. *Salix tristis.*
nse. *Salix humilis.*
nse. *Salix discolor.*
new. *Salix rostrata.*
new. *Salix longifolia.*
new. *Salix lucida.*
new. *Corylus rostrata.*
nse. *Corylus americana.*
ne. *Betula pumila,*
new. *Alnus incana.*
new. *Comandra livida.*
new. *Comandra umbellata.*
nw. *Comandra pallida.*
nse. *Menispermum canadense.*
new. *Ribes rubrum* var. *albinervium.*
nse. *Ribes floridum.*
new. *Ribes oxycanthoides.*
sew. *Ribes gracile.*
sew. *Ribes cynobasti.*
nsew. *Opulaster opulifolius.*
nse. *Spiraea tomentosa.*
nse. *Celastrus scandens.*
nse. *Ilex verticillata.*
nse. *Staphylea trifolia.*
sew. *Ceanothus ovatus.*
se. *Ceanothus americanus.*
ne. *Rhamnus alnifolia.*
se. *Parthenocissus quinquefolia.*
se. *Vitis aestivalis.*
se. *Vitis riparia.*
se. *Vitis cordifolia.*
se. *Hypericum prolificum.*

se. *Dirca palustris.*
new. *Spiraea salicifolia.*
se. *Pirus arbutifolia.*
nse. *Rubus hispidus.*
ne. *Rubus canadensis.*
nse. *Rubus villosus.*
new. *Rubus occidentalis.*
new. *Rubus strigosus.*
new. *Rubus triflorus.*
new. *Potentilla tridentata.*
new. *Potentilla fruticosa.*
nse. *Rosa humilis.*
se. *Rosa carolina.*
nsw. *Rosa pisocarpa.*
nw. *Rosa acicularis.*
new. *Rosa virginiana.*
sw. *Rosa virginiana* var. *arkansana.*
nse. *Cerasus pumila.*
nsw. *Amorpha canescens.*
nsw. *Amorpha microphylla.*
sew. *Amorpha fruticosa.*
nse. *Zanthoxylum americanum.*
se. *Ptelea trifoliata.*
se. *Rhus radicans.*
se. *Rhus copallina.*
se. *Rhus vernix.*
se. *Rhus glabra.*
se. *Evonymus atropurpureus.*
nsw. *Leptargyria argentea.*
ne. *Elæagnus argentea.*
sw. *Oenothera serrulata.*
new. *Cornus canadensis.*
se. *Cornus candidissima.*
se. *Cornus asperifolia.*
new. *Cornus stolonifera.*
se. *Cornus sericea.*
nse. *Cornus circinatus.*

Metachlamydeae.

se. *Pseva maculata.*
nsew. *Pseva umbellata.*
new. *Ledum latifolium.*
new. *Andromeda polifolia.*
new. *Lyonia calyculata.*
new. *Chiogenes hispidula.*
new. *Arctostaphylos uva-ursi.*
new. *Oxycoccus macrocarpus.*
new. *Oxycoccus oxycoccus.*
ne. *Vaccinium corymbosum* var. *amoenum.*
ne. *Vaccinium canadense.*
ne. *Vaccinium pennsylvanicum.*
se. *Vaccinium stamineum.*
new. *Linnaea borealis.*

new. *Symphoricarpos racemosus.*
new. *Symphoricarpos racemosus* var. *pauciflorus.*
nw. *Symphoricarpos occidentalis.*
se. *Symphoricarpos symphoricarpos.*
new. *Lonicera glauca.*
nsew. *Lonicera sullivantii.*
new. *Lonicera ciliata.*
nse. *Diervilla diervilla.*
new. *Sambucus racemosa.*
sew. *Sambucus canadensis.*
se. *Viburnum pubescens.*
se. *Viburnum dentatum.*
nsw. *Artemisia dracunculoides.*

From Table H the following statistics are compiled:

33. The Shrubby Specific Element.

| | No. of species. | Per cent. of all shrubby sp. | Shrubby per cent. of each. |
|----------------------------------|-----------------|------------------------------|----------------------------|
| Monocotyledones..... | 2 | 1.9 | 0.6 |
| Archichlamydeae | 75 | 72.1 | 16.3 |
| Metachlamydeae | 27 | 25.9 | 7.1 |
| Total Shrubby | 104 | | |
| Shrubby per cent. of all species | 8.8 | | |

The remainder of the Metaspermae of the Minnesota valley may be classified as herbaceous, and of this element the statistics are as follows:

34. The Herbaceous Specific Element.

| | No. of species. | Per cent. of all herbaceous. | Herbaceous per cent. of each. |
|----------------------------------|-----------------|------------------------------|-------------------------------|
| Monocotyledones..... | 331 | 32.4 | 99.4 |
| Archichlamydeae | 340 | 33.4 | 74.0 |
| Metachlamydeae | 346 | 34.0 | 91.0 |
| Total Herbaceous..... | 1017 | | |
| Herb. per cent. of all species.. | 86.6 | | |

From the above three tabulations it is seen that the herbaceous per cent. of the Monocotyledones is generally in excess of the herbaceous per cents of the other two groups. And the woody percentage of the Archichlamydeæ is generally in excess of the woody percentages of the other two groups. In the latitude of the Minnesota valley many of the original monocotyledonous trees or shrubs have disappeared. All of the trees are gone and all but two of the shrubs have failed up to the present time to secure or regain a foothold. This we understand from the considerations indicated in the pre-

ceding chapter, where the original presence of palms and allied forms was discussed. On the other hand, the Metachlamydeæ with their 1.8 per cent. of trees and 7.1 percent. of shrubs have as yet failed to develop many shrubby or arboreal plants in this latitude. The antiquity and lower organisation of the Monocotyledones are therefore seen to have been reflected in the physiognomy of the valley to-day in a manner similar to that in which the recentness and higher organisation of the Metachlamydeæ have been reflected. The absence of monocotyledonous trees and shrubs is due to their having been obliterated ages ago by the stronger archichlamydeous forms, together with the geological progression of climatic and topographical changes. The absence of the metachlamydeous trees and shrubs, compared with the abundance of the Archichlamydeæ, is doubtless owing to entirely different causes. Not obliteration but failure to reach the valley is the explanation of their absence. Palæontological remains do not indicate that metachlamydeous trees or shrubs were ever before so abundant in the Minnesota valley as they are to-day. The same evidence shows that in the Cretaceous and Tertiary periods there *were* palms in the valley. Thus by direct evidence is corroborated what might *a priori* be derived from the study of modern distribution. Together with the predominant herbaceousness of the Monocotyledones must be read their antiquity and their preponderantly extra and intra-continental width of range. Together with the only less predominant herbaceousness of the Metachlamydeæ must be read their recentness and their preponderantly endemic and limited range. Thus the character of the other taxonomic group may be stated in terms as follows:

The Archichlamydeæ, forming 86.7 per cent. of the arboreal element and 72.1 per cent of the shrubby element have on the one hand had sufficient time to develop their habit and to reach the Minnesota valley, while on the other hand they are not to such an extent a lower group, nor so ancient that they have been erased from the distinctively extratropical regions. From both sides they have been favored in the development of arboreal characters, and for ages will doubtless maintain themselves in extratropical regions as the characteristic trees and shrubs, although ultimately, the logic of history would seem to destine them for extinction under the attack of arborescent *Senecios*, *Helianthi* or *Solidagos*, or of other composite or composite-like forms that had attained the arboreal habit.

The progression of percentages from Monocotyledones to Metachlamydeæ, as read in the last columns of the three preceding tabulations, gives interesting testimony to the correctness of the views (by no means new) that are presented in the paragraphs above. As compacted below this progression is certainly instructive.

| | Arb. per cent. | Shrubby per cent. | Herb. per cent. |
|-----------------------|-------------------|----------------------|--------------------|
| Monocotyledones | .0 | 0.6 | 99.4 |
| Archichlamydeæ | 10.0 | 16.3 | 74.0 |
| Metachlamydeæ | 1.8 | 7.1 | 91.0 |

The differences are widest between the monocotyledonous and least between the archichlamydeous percentages.

The three habitat-elements may now be considered. In Table J is listed the aquatic element.

J. Table of Aquatic Metaspermae Indigenous to the Minnesota Valley.

Monocotyledones.

- | | |
|--|-------------------------------------|
| <i>nsew.</i> Potamogeton natans. | <i>nsew.</i> Najas flexilis. |
| <i>nsew.</i> Potamogeton fluitans. | <i>nsew.</i> Elodea canadensis. |
| <i>nsew.</i> Potamogeton amplifolius. | <i>se.</i> Vallisneria spiralis. |
| <i>nse.</i> Potamogeton perfoliatus. | <i>se.</i> Zizania aquatica. |
| <i>new.</i> Potamogeton heterophyllos. | <i>new.</i> Panicularia fluitans. |
| <i>nse.</i> Potamogeton gramineus var. | <i>new.</i> Scirpus fluviatilis. |
| zizii. | <i>nsew.</i> Scirpus lacustris. |
| <i>se.</i> Potamogeton illinoensis. | <i>nsew.</i> Heleocharis palustris. |
| <i>nsew.</i> Potamogeton pusillus. | <i>nsew.</i> Lemna minor. |
| <i>new.</i> Potamogeton rutilus. | <i>nse.</i> Lemna perpusilla. |
| <i>nsew.</i> Potamogeton pectinatus. | <i>nsew.</i> Lemna trisulca. |
| <i>nsew.</i> Potamogeton lucens. | <i>nsew.</i> Lemna polyrhiza. |
| <i>new.</i> Potamogeton praelongus. | <i>se.</i> Grantia brasiliensis. |
| <i>nsew.</i> Potamogeton lanceolatus. | <i>se.</i> Grantia columbiana. |
| <i>new.</i> Potamogeton zosteræfolius. | <i>nse.</i> Pontederia cordata. |
| <i>new.</i> Potamogeton foliosus. | <i>sew.</i> Heteranthera dubia. |
| <i>nsew.</i> Zannichellia palustris. | |

Archichlamydeæ.

- | | |
|--|--|
| <i>se.</i> Polygonum hydropiperoides. | <i>new.</i> Ranunculus aquatilis var. |
| <i>nsew.</i> Polygonum amphibium. | caespitosus. |
| <i>se.</i> Nelumbo nelumbo. | <i>new.</i> Ranunculus circinnatus. |
| <i>sew.</i> Brasenia peltata. | <i>nsew.</i> Stellaria verna. |
| <i>nse.</i> Leuconymphaea reniformis. | <i>nsew.</i> Hippuris vulgaris. |
| <i>se.</i> Leuconymphaea odorata. | <i>se.</i> Myriophyllum heterophyllum |
| <i>nsew.</i> Nymphaea advena. | <i>se.</i> Myriophyllum verticillatum. |
| <i>sew.</i> Ceratophyllum demersum. | <i>nse.</i> Myriophyllum spicatum. |
| <i>new.</i> Ranunculus lacustris. | |
| <i>nsew.</i> Ranunculus aquatilis var. | |
| trichophyllos. | |

Metachlamydeæ.

- | | |
|------------------------------------|-------------------------------------|
| <i>se.</i> Nymphodes lacunosum. | <i>new.</i> Utricularia intermedia. |
| <i>sew.</i> Mimulus glabratus var. | <i>new.</i> Utricularia minor. |
| jamesii. | <i>nsew.</i> Utricularia vulgaris. |
| <i>new.</i> Veronica anagallis. | <i>nse.</i> Bidens beckii. |
| <i>se.</i> Utricularia cornuta. | |

The swamp and marsh element may next be listed.

K. Table of Swamp and Marsh Metaspermae Indigenous to the Minnesota Valley.

Monocotyledones.

- | | |
|---|--|
| <i>nsew.</i> Typha latifolia. | <i>nsew.</i> Carex tribuloides var. cristata. |
| <i>new.</i> Sparganium simplex. | <i>nse.</i> Carex muskingumensis. |
| <i>nsew.</i> Sparganium angustifolium. | <i>ne.</i> Carex trisperma. |
| <i>nse.</i> Sparganium eurycarpum. | <i>ne.</i> Carex tenuiflora. |
| <i>new.</i> Triglochin palustris. | <i>new.</i> Carex canescens. |
| <i>new.</i> Triglochin maritima. | <i>nsew.</i> Carex echinata var. radiata. |
| <i>new.</i> Scheuchzeria palustris. | <i>nse.</i> Carex rosea. |
| <i>new.</i> Alisma plantago. | <i>nse.</i> Carex rosea var. radiata. |
| <i>se.</i> Sagittaria rigida. | <i>new.</i> Carex tenella. |
| <i>se.</i> Sagittaria graminea. | <i>new.</i> Carex teretiuscula. |
| <i>new.</i> Sagittaria sagittifolia. | <i>new.</i> Carex teretiuscula var. ramosa. |
| <i>se.</i> Panicum crus-galli. | <i>se.</i> Carex crus-corvi. |
| <i>se.</i> Zizania aquatica var. hispidum. | <i>ne.</i> Carex chordorhiza. |
| <i>nsew.</i> Homalocenchrus oryzoides. | <i>nsew.</i> Carex polytrichoides. |
| <i>se.</i> Homalocenchrus virginicus. | <i>se.</i> Carex laxiflora. |
| <i>new.</i> Phalaris arundinacea. | <i>new.</i> Carex flava var. viridula. |
| <i>new.</i> Hierochloë odorata var. fragrans. | <i>nse.</i> Carex crawei. |
| <i>nsew.</i> Muhlenbergia racemosa. | <i>se.</i> Carex granularis. |
| <i>nsew.</i> Alopecurus geniculatus var. aristulatus. | <i>se.</i> Carex davisii. |
| <i>nsew.</i> Cinna arundinacea. | <i>nse.</i> Carex gracillima. |
| <i>nw.</i> Beckmannia erucaeformis. | <i>new.</i> Carex limosa. |
| <i>nsew.</i> Phragmites phragmites. | <i>new.</i> Carex magellanica. |
| <i>new.</i> Poa palustris. | <i>nse.</i> Carex crinita. |
| <i>nw.</i> Scolochloa festuacea. | <i>nse.</i> Carex prasina. |
| <i>new.</i> Panicularia americana. | <i>new.</i> Carex aquatilis. |
| <i>nsew.</i> Panicularia nervata. | <i>nsew.</i> Carex fusca. |
| <i>ne.</i> Panicularia elongata. | <i>nse.</i> Carex riparia. |
| <i>ne.</i> Panicularia canadensis. | <i>nse.</i> Carex trichocarpa. |
| <i>nsew.</i> Dulichium spathaceum. | <i>new.</i> Carex trichocarpa var. aristata. |
| <i>nsew.</i> Cyperus strigosus. | <i>new.</i> Carex filiformis. |
| <i>nse.</i> Eriophorum virginicum. | <i>nsew.</i> Carex filiformis var. lanuginosa. |
| <i>new.</i> Eriophorum gracile. | <i>se.</i> Carex squarrosa. |
| <i>new.</i> Eriophorum latifolium. | <i>ne.</i> Carex pseudocyperus. |
| <i>new.</i> Eriophorum polystachion. | <i>nsew.</i> Carex pseudocyperus var. americana. |
| <i>new.</i> Eriophorum vaginatum. | <i>nse.</i> Carex hystrix. |
| <i>new.</i> Eriophorum cyperinum. | <i>nse.</i> Carex schweinitzii. |
| <i>sew.</i> Eriophorum lineatum. | <i>nse.</i> Carex lurida. |
| <i>nsew.</i> Scirpus atrovirens. | <i>new.</i> Carex retrorsa. |
| <i>nw.</i> Scirpus sylvaticus var. microcarpus. | <i>ne.</i> Carex tuckermanni. |
| <i>nsew.</i> Scirpus triangularis. | <i>nsew.</i> Carex monile. |
| <i>sw.</i> Heleocharis wolffii. | <i>nsew.</i> Carex utriculata. |
| <i>nsew.</i> Heleocharis acicularis. | <i>new.</i> Carex oligosperma. |
| <i>nse.</i> Heleocharis tenuis. | <i>nse.</i> Carex lupulina. |
| <i>nse.</i> Heleocharis intermedia. | <i>se.</i> Carex lupulina var. longipedunculata. |
| <i>se.</i> Heleocharis acuminata. | <i>nse.</i> Carex intumescens. |
| <i>nsew.</i> Heleocharis palustris. | <i>new.</i> Carex pauciflora. |
| <i>se.</i> Heleocharis palustris var. glaucescens. | <i>nse.</i> Acorus calamus. |
| <i>nsew.</i> Heleocharis ovata. | <i>ne.</i> Spathyema foetida. |
| <i>sew.</i> Mariscus mariscoides. | <i>ne.</i> Calla palustris. |
| <i>nse.</i> Rhynchospora setacea. | <i>ne.</i> Eriocaulon septangulare. |
| <i>nsew.</i> Rhynchospora alba. | <i>nsew.</i> Juncus tenuis. |
| <i>se.</i> Scleria verticillata. | <i>new.</i> Juncus vaseyi. |
| <i>se.</i> Scleria triglomerata. | <i>new.</i> Juncus balticus var. littoralis. |

new. *Juncus filiformis.*
nsew. *Juncus effusus.*
new. *Juncus nodosus* var. *genuinus.*
sew. *Juncus nodosus* var. *megac-*
phalus.
new. *Juncus canadensis* var. *coar-*
tatus.
nse. *Juncus canadensis* var. *longe-*
caudatus.
se. *Juncus acuminatus* var.
legitimus.
se. *Melanthium virginicum.*
new. *Veratrum viride.*
se. *Lilium canadense.*
new. *Clintonia borealis.*
new. *Unifolium bifolium.*
new. *Unifolium trifolium.*
se. *Iris versicolor.*
new. *Cypripedium acaule.*
nse. *Cypripedium spectabile.*
nsew. *Cypripedium pubescens.*

new. *Cypripedium parviflorum.*
nsew. *Cypripedium candidum.*
ne. *Cypripedium arietinum.*
nse. *Habenaria psycodes.*
nse. *Habenaria lacera.*
ne. *Habenaria hookeriana.*
new. *Habenaria dilatata.*
new. *Habenaria hyperborea.*
new. *Habenaria bracteata.*
nse. *Habenaria flava.*
nse. *Habenaria tridentata.*
nse. *Pogonia ophioglossoides.*
ne. *Arethusa bulbosa.*
nse. *Gyrostachys cernua.*
new. *Gyrostachys romanzowiana.*
ne. *Leptorchis loeselii.*
se. *Leptorchis liliifolia.*
new. *Corallorhiza corallorhiza.*
nse. *Cathea tuberosa.*
nsew. *Aplectrum spicatum.*

Archichlamydeae.

nse. *Populus grandidentata.*
new. *Salix myrtilloides.*
new. *Salix cordata.*
nse. *Salix cordata* var. *angustata.*
ne. *Betula pumila.*
new. *Alnus incana.*
se. *Rumex verticillatus.*
new. *Rumex salicifolius.*
nsew. *Rumex persicarioides.*
se. *Polygonum acre.*
new. *Polygonum hydropiper.*
se. *Polygonum hydropiperoides.*
nsew. *Polygonum hartwrightii.*
sew. *Polygonum emersum.*
nsew. *Polygonum incarnatum.*
new. *Stellularia crassifolia.*
new. *Caltha palustris.*
new. *Isopyrum trifolium.*
nsew. *Ranunculus sceleratus.*
nsew. *Ranunculus ambigen.*
nsew. *Nasturtium hispidum.*
nsew. *Nasturtium palustre.*
nsew. *Cardamine hirsuta.*
se. *Cardamine bulbosa.*
new. *Sarracenia purpurea.*
nw. *Drosera linearis.*
new. *Drosera intermedia* var.
americana.
new. *Drosera rotundifolia.*
se. *Penthorum sedoides.*
ne. *Saxifraga pennsylvanica.*
new. *Mitella nuda.*
se. *Parnassia caroliniana.*
new. *Parnassia palustris.*

nse. *Spiraea tomentosa.*
new. *Spiraea salicifolia.*
new. *Potentilla fruticosa.*
new. *Potentilla palustris.*
nse. *Geum rivale.*
nse. *Rosa humilis.*
se. *Rosa carolina.*
nsew. *Lathyrus palustris.*
nsew. *Lathyrus palustris* var.
myrtifolius.
se. *Rhus vernix.*
se. *Acer rubrum.*
new. *Impatiens biflora.*
nsew. *Impatiens aurea.*
se. *Hypericum canadense.*
nse. *Hypericum virginicum.*
new. *Viola sylvestris.*
new. *Viola blanda.*
nse. *Viola blanda* var. *amoena.*
nsew. *Isnardia palustris.*
se. *Isnardia polycarpa.*
nse. *Epilobium coloratum.*
ne. *Epilobium strictum.*
new. *Epilobium palustre.*
new. *Epilobium lineare.*
new. *Circaea alpina.*
nsew. *Heracleum lanatum.*
ne. *Cicuta bulbifera.*
nsew. *Cicuta virosa* var. *maculata.*
nsew. *Sium cicutaefolium.*
new. *Cornus canadensis.*
new. *Cornus stolonifera.*
se. *Cornus sericea.*

Metachlamydeae.

- | | |
|--|---|
| <i>nsew.</i> <i>Pirola elliptica.</i> | <i>new.</i> <i>Mentha canadensis.</i> |
| <i>new.</i> <i>Pirola rotundifolia.</i> | <i>se.</i> <i>Chelone glabra.</i> |
| <i>new.</i> <i>Pirola rotundifolia</i> var. <i>uliginosa.</i> | <i>sew.</i> <i>Gratiola virginiana.</i> |
| <i>new.</i> <i>Lyonia calyculata.</i> | <i>sew.</i> <i>Ilysanthes gratioides.</i> |
| <i>new.</i> <i>Chiogenes hispidula.</i> | <i>new.</i> <i>Veronica scutellata.</i> |
| <i>new.</i> <i>Oxycoccus macrocarpus.</i> | <i>new.</i> <i>Veronica americana.</i> |
| <i>new.</i> <i>Oxycoccus oxycoccus.</i> | <i>se.</i> <i>Synthyris houghtoniana.</i> |
| <i>ne.</i> <i>Vaccinium corymbosum</i> var. <i>amoenum.</i> | <i>sew.</i> <i>Monniera rotundifolia.</i> |
| <i>ne.</i> <i>Vaccinium canadense.</i> | <i>nse.</i> <i>Galium asprellum.</i> |
| <i>new.</i> <i>Lysimachia thyrsiflora.</i> | <i>nsew.</i> <i>Galium trifidum.</i> |
| <i>se.</i> <i>Steironema quadriflorum.</i> | <i>se.</i> <i>Galium trifidum</i> var. <i>latifolium.</i> |
| <i>se.</i> <i>Steironema lanceolatum</i> var. <i>hybridum.</i> | <i>ne.</i> <i>Campanula aparinoides.</i> |
| <i>nsew.</i> <i>Steironema ciliatum.</i> | <i>new.</i> <i>Lobelia kalmii.</i> |
| <i>ne.</i> <i>Trientalis americana.</i> | <i>nsew.</i> <i>Eupatorium purpureum.</i> |
| <i>new.</i> <i>Menyanthes trifoliata.</i> | <i>sew.</i> <i>Solidago riddellii.</i> |
| <i>se.</i> <i>Gentiana flavida.</i> | <i>ne.</i> <i>Solidago neglecta.</i> |
| <i>se.</i> <i>Gentiana andrewsii.</i> | <i>nsew.</i> <i>Aster puniceus.</i> |
| <i>new.</i> <i>Gentiana serrata.</i> | <i>nse.</i> <i>Aster puniceus</i> var. <i>lucidus.</i> |
| <i>ne.</i> <i>Gentiana americana.</i> | <i>se.</i> <i>Aster nova-belgii.</i> |
| <i>se.</i> <i>Asclepias incarnata.</i> | <i>se.</i> <i>Aster vimineus.</i> |
| <i>se.</i> <i>Phlox maculata.</i> | <i>sw.</i> <i>Helianthus maxmiliani.</i> |
| <i>nsew.</i> <i>Stachys palustris.</i> | <i>se.</i> <i>Coreopsis aristosa.</i> |
| <i>nsew.</i> <i>Lycopus sinuatus.</i> | <i>sew.</i> <i>Bidens laevis.</i> |
| <i>nsw.</i> <i>Lycopus lucidus</i> var. <i>obtusifolius.</i> | <i>nsew.</i> <i>Bidens cernua.</i> |
| <i>se.</i> <i>Lycopus rubellus.</i> | <i>se.</i> <i>Bidens connata.</i> |
| <i>nsew.</i> <i>Lycopus virginicus.</i> | <i>nsew.</i> <i>Helenium autumnale.</i> |
| | <i>sw.</i> <i>Senecio lugens.</i> |
| | <i>new.</i> <i>Senecio palustris.</i> |

Of the three habitat elements the following statistical tabulations are presented:

35. The Aquatic Element.

| 35. The Aquatic Element. | | | |
|----------------------------------|-----------------|---------------------------|----------------------------|
| | No. of species. | Per cent. of all aquatic. | Aquatic per cent. of each. |
| Monocotyledones..... | 32 | 56.1 | 9.6 |
| Archichlamydeae..... | 17 | 29.8 | 3.7 |
| Metachlamydeae..... | 8 | 14.0 | 2.1 |
| Total Aquatic..... | 57 | | |
| Aquatic per cent. of all species | 4.9 | | |

36. The Marsh and Swamp Element.

| | No. of species. | Per cent. of all M. and S. | M. and S. per cent. of each. |
|------------------------------------|-----------------|----------------------------|------------------------------|
| Monocotyledones..... | 145 | 54.8 | 43.8 |
| Archichlamydeae..... | 65 | 24.6 | 14.1 |
| Metachlamydeae.... | 54 | 20.4 | 14.1 |
| Total M. and S..... | 264 | | |
| M. and S. per cent. of all species | 22.5 | | |

37. The Drier-Soil Element.

| | No. of species. | Per cent. of all D. S. | D. S. per cent. of each. |
|-----------------------------------|-----------------|------------------------|--------------------------|
| Monocotyledones..... | 157 | 18.2 | 47.0 |
| Archichlamydeae..... | 377 | 44.1 | 82.2 |
| Metachlamydeae..... | 319 | 37.7 | 83.8 |
| Total Drier-soil..... | 853 | | |
| D.-S. per cent. of all species... | 72.6 | | |

In the aquatic element the preponderance of Monocotyledones is to be noted. This taxonomic group is also apparent as forming the greater percentage of the marsh and swamp element. On the other hand the Metachlamydeae are preponderant in the drier-soil element, although their percentage is practically equivalent to that of the Archichlamydeae. These statements are based upon the third column of figures, and thus correction is made for the actual numerical differences of the three taxonomic groups. In this way a more exact notion is given than if such correction was not made, and in general, it may be said that the analysis must always take into account the varying actual numbers of one group or another. In the marsh and swamp element we find an interesting confirmation, so far as these figures are of value in evidence, of the views stated on pp. 602-603 above, where the Cretaceous physiognomy is briefly

discussed. It will be observed that the marsh and swamp element forms a percentage of the Metachlamydeae exactly equivalent to the similar percentage of the Archichlamydeae. In this case the explanation may be that the younger group of the Metachlamydeae furnishes so large a percentage of this element, comparatively, because the influence of the tensions is such that in a younger group many weaker plants will be forced into the morassic habitat. It is apparent that either the plants of new and variable type or the plants of an older and less plastic type will be less competent to struggle for the optimum habitat than a group of plants neither too modern nor too ancient. In the marsh and swamp percentages of the modern valley may therefore be read a word or two concerning those long-past ages when the Archichlamydeae in turn were similarly conditioned in their relations with the conifers of the old Cretaceous flora.

It will be interesting to examine the ranges in the continent of these two groups of physiognomic elements. Tabulations are readily compiled from Tables G, H, J and K. The following tabulation will serve to indicate in a general way the range peculiarities of the habit-elements:

| 38. RANGE-STATISTICS OF THE HABIT-ELEMENTS. | TREES. | | | | SHRUBS. | | | | HERBS. | | | |
|--|------------------|------------------|-----------------|---------|------------------|------------------|-----------------|---------|------------------|------------------|-----------------|---------|
| | Monocotyledones. | Archichlamydeae. | Metachlamydeae. | Totals. | Monocotyledones. | Archichlamydeae. | Metachlamydeae. | Totals. | Monocotyledones. | Archichlamydeae. | Metachlamydeae. | Totals. |
| Northern species..... | 0 | 20 | 2 | 22 | 0 | 51 | 21 | 72 | 226 | 186 | 136 | 568 |
| Southern species..... | 0 | 41 | 6 | 47 | 2 | 47 | 10 | 59 | 227 | 256 | 303 | 786 |
| Eastern species..... | 0 | 46 | 7 | 53 | 2 | 67 | 25 | 94 | 308 | 283 | 284 | 875 |
| Western species..... | 0 | 13 | 2 | 15 | 0 | 34 | 18 | 52 | 176 | 182 | 178 | 536 |
| Per cent. of all northern..... | 0 | 90.9 | 9.1 | 100. | 0 | 70.6 | 29.4 | 100. | 39.7 | 32.7 | 27.6 | 100. |
| Per cent. of all southern..... | 0 | 87.2 | 12.8 | 100. | 4.4 | 79.5 | 16.1 | 100. | 28.8 | 32.5 | 38.7 | 100. |
| Per cent. of all eastern..... | 0 | 86.7 | 13.3 | 100. | 2.3 | 71.2 | 26.5 | 100. | 34.1 | 32.3 | 33.6 | 100. |
| Per cent. of all western..... | 0 | 86.3 | 13.7 | 100 | 0 | 65.3 | 34.7 | 100. | 32.8 | 33.9 | 33.3 | 100. |
| Northern per cent. of each..... | 0 | 41.6 | 29.5 | 40.0 | 0 | 68.0 | 77.7 | 69.1 | 68.2 | 54.7 | 39.3 | 55.8 |
| Southern per cent. of each..... | 0 | 85.4 | 95.7 | 85.4 | 100. | 62.6 | 37.0 | 56.7 | 68.5 | 75.2 | 87.5 | 77.2 |
| Eastern per cent. of each..... | 0 | 95.8 | 100. | 96.3 | 100. | 39.3 | 92.6 | 90.3 | 93.0 | 83.2 | 82.0 | 86.0 |
| Western per cent. of each..... | 0 | 27.0 | 29.5 | 27.2 | 0 | 45.3 | 66.6 | 50.0 | 53.1 | 53.5 | 51.4 | 52.7 |
| Total species..... | 0 | 48 | 7 | 55 | 2 | 75 | 27 | 104 | 331 | 340 | 346 | 1017 |

Upon comparing the preceding table with the general tables of specific range on pp. 715-716, a number of instructive points will be discovered.

The trees of the Minnesota valley are much more distinctively southern than the general population. They are also much more distinctively eastern. This is readily noted by comparing the per cents of totals, for each element of range, in the general and the special tables. This southernness and easternness is more marked in the case of the metachlamydeous trees than of the archichlamydeous, but in either is in excess of the southern and eastern per cents of the total taxonomic groups. Conversely, the trees are decidedly less northern in their character than the general population. The Archichlamydeæ are, however, more northern than the Metachlamydeæ. Of the metachlamydeous trees a slightly larger percentage show the western range than of the archichlamydeous trees. This is due to the general lateral solidarity which has been pointed out as a characteristic of the Metachlamydeæ.

The shrubs of the Minnesota valley present opposite range characters, in comparison with the trees. They are more distinctly northern than southern and the northernness is in excess over that of the general population while the southernness is considerably less. Between the eastern and western per cents of the shrubby element and of the whole element there is less difference, but the shrubs are a trifle more eastern in character than the general flora. The northernness of the metachlamydeous shrubs is more pronounced than the northernness of the archichlamydeous shrubs, while the metachlamydeous shrubs are both more eastern and more western than the archichlamydeous. This, again, is a result of metachlamydeous lateral solidarity. The strong northernness of metachlamydeous shrubs is the most remarkable feature of shrub distribution in the valley of the Minnesota. It may perhaps be attributed to the influence of the tensions upon habit. The shrubby habit might be expected to emerge more strongly farthest from the Central region.

The herbs of the valley are distributed very much like the general element. The differences between the trees and shrubs serve to neutralise each other and the residuum is only slightly more northern, southern and western and only slightly less eastern than the total flora.

Passing next to the habitat elements a similar table of range statistics may be considered.

| 39. RANGE-STATISTICS OF THE HABITAT-ELEMENTS. | AQUATICS. | | | | MARSH-PLANTS. | | | | DRIER-SOIL PLANTS. | | | |
|---|------------------|------------------|-----------------|---------|------------------|------------------|-----------------|---------|--------------------|------------------|-----------------|---------|
| | Monocotyledones. | Archichlamydeae. | Metachlamydeae. | Totals. | Monocotyledones. | Archichlamydeae. | Metachlamydeae. | Totals. | Monocotyledones. | Archichlamydeae. | Metachlamydeae. | Totals. |
| Northern species..... | 26 | 10 | 5 | 41 | 119 | 52 | 33 | 204 | 81 | 195 | 121 | 397 |
| Southern species..... | 25 | 14 | 5 | 44 | 82 | 36 | 34 | 152 | 122 | 294 | 280 | 696 |
| Eastern species..... | 32 | 17 | 8 | 57 | 141 | 64 | 51 | 256 | 137 | 315 | 257 | 709 |
| Western species..... | 23 | 10 | 5 | 38 | 80 | 41 | 32 | 153 | 73 | 178 | 161 | 412 |
| Per cent. of all northern. | 63.4 | 24.3 | 12.3 | 100. | 58.3 | 25.4 | 16.3 | 100. | 20.4 | 49.1 | 30.5 | 100. |
| Per cent. of all southern. | 56.8 | 31.8 | 11.4 | 100. | 53.9 | 23.6 | 12.5 | 100. | 17.5 | 42.2 | 40.3 | 100. |
| Per cent. of all eastern... | 56.1 | 30.0 | 13.9 | 100. | 55.0 | 24.6 | 10.4 | 100. | 19.3 | 44.4 | 36.3 | 100. |
| Per cent. of all western.. | 60.5 | 26.3 | 13.2 | 100. | 52.2 | 26.7 | 21.1 | 100. | 17.7 | 43.2 | 39.1 | 100. |
| North'rn per cent of each | 81.2 | 58.8 | 62.6 | 71.9 | 82.0 | 80.0 | 61.1 | 77.2 | 51.5 | 51.7 | 37.8 | 47.7 |
| Southern per cent. of each | 78.1 | 82.3 | 62.6 | 77.1 | 56.5 | 55.3 | 62.9 | 57.5 | 77.7 | 77.9 | 87.7 | 81.5 |
| Eastern per cent. of each | 100. | 100. | 100. | 100. | 97.2 | 98.4 | 94.4 | 96.9 | 87.2 | 83.5 | 80.5 | 83.1 |
| Western per cent. of each | 71.8 | 58.8 | 62.6 | 66.6 | 55.1 | 63.0 | 59.2 | 57.9 | 46.4 | 44.5 | 50.4 | 48.1 |
| Total species..... | 32 | 17 | 8 | 57 | 145 | 65 | 54 | 264 | 157 | 377 | 319 | 853 |

From the above table it is seen immediately that the aquatic plants are more general in their continental distribution than the marsh and swamp plants and these in turn more generally distributed than the drier-soil plants. The aquatics, however, are strongly eastern, presenting indeed their total number in this range; the marsh and swamp plants are only less eastern while the easternness of the drier-soil plants is the least of the three. The marsh-plants lead in northernness while the drier-soil plants excel in southernness. In westernness the ratios are similar to those of easternness, owing to the differences of general distribution. Comparing each element with the total flora we may note first the aquatics.

The aquatic element exceeds the total flora in all four elements of range. This indicates, in an accurate and instructive manner, the widely distributed character of aquatic plants. The southern per cent. of aquatic Metachlamydeae is, however, less than the southern per cent. of all Metachlamydeae, while the northern per cent. is considerably greater. Again there is

necessity of explaining such a fact by the tension-lines and the law of ejections, and reciprocally the fact of distribution is of value as evidence of the soundness of the law.

The marsh-plants exceed the total flora in northernness, easternness and westernness, but fall behind in southernness. Not yet fully distributed as are the aquatics, they indicate better the influence of the continental tension. Marsh plants in a given region of the northern hemisphere may be expected to present distal rather than central characters, for as has been discussed above, the tendency to adopt the morassic habitat is a distal or tension-line phenomenon. As might be expected where different forces are acting to determine the percentages one will often partly neutralise another. It is seen, for example, in the table, that the northern and southern percentages of the metachlamydeous marsh-plants are very close together, while the eastern and western percentages are not so close. This is just the reverse of the condition among the Metachlamydeae as a group, in the Minnesota-valley flora, and indicates the selective influence of habitat upon range. In the drier-soil element, on the other hand, the condition of the total flora reappears and is accentuated.

The drier-soil plants lead the total flora only in southernness, while in northernness, easternness and westernness they fall behind. Of the element, the Archichlamydeae lead in northernness, the Metachlamydeae in southernness, the Monocotyledones in easternness and the Metachlamydeae in westernness. The Archichlamydeae of the drier-soil are less northern, more southern, less eastern and less western than in the total element. The Metachlamydeae of the drier-soil are less northern, more southern, less eastern and less western than in the total element. The Monocotyledones do not differ from the two groups mentioned, in this particular. That both the easternness and westernness of the drier-soil element should be decreased in all taxonomic groups indicates the wide east and west distribution of the two elements the removal of which leaves it as the residuum.

In general the study of the tables which indicate the range of the physiognomic elements will add weight to the belief that the three taxonomic groups are of different and distinct meaning in the distribution. Space scarcely permits as exhaustive an analysis as might be useful but enough has been noted in passing to show how a further and more complete analysis should properly proceed. Careful examination of the tables and com-

parison of their data throughout, with those in the general tables in the section preceding will serve to bring before the reader many kindred facts not mentioned in detail in these pages.

V. EXAMINATION OF DOMINANT METASPERMIC FAMILIES OF THE MINNESOTA VALLEY.

Such families as contain a relatively large number of species may be known as the dominant families of the district. Thirteen such families, each with twenty-two species in the valley, or more than twenty-two, may be recognised. The dominant families furnish 217 genera or 53.5 per cent. of all genera in the valley, and 727 species or 61.0 per cent. of the total valley species. In order of their importance they may be arranged as follows:

| | Gen. | Spec. |
|-----------------------|---------|-------|
| Compositae..... | 43..... | 173 |
| Cyperaceae..... | 11..... | 118 |
| Gramineae..... | 39..... | 89 |
| Leguminosae..... | 21..... | 55 |
| Rosaceae..... | 13..... | 54 |
| Ranunculaceae..... | 11..... | 42 |
| Liliaceae..... | 15..... | 36 |
| Scrophulariaceae..... | 13..... | 32 |
| Orchidaceae..... | 12..... | 30 |
| Cruciferae..... | 10..... | 30 |
| Labiatae..... | 14..... | 24 |
| Polygonaceae..... | 2..... | 23 |
| Umbelliferae..... | 13..... | 22 |

Each of these families is represented in the valley by a group of species of a definite distributional and physiognomic character. To present these characters is the office of the two tabulations following. In the first, the generic statistics are compiled, in the second, the specific.

| 40. STATISTICS OF THE DOMINANT FAMILIES. <i>Generic.</i> | No. of genera. | No. cosmop. gen. | No. extratrop. gen. | No. trop. and sub- trop. gen. | No. N. extratrop. gen. | No. W. Hemisphere gen. | No. N. American gen. | Per cent. of all cos- mop. gen. | Per cent. of all ex- tra trop. gen. | Per cent. of all trop. gen. | Per cent. of all N extratrop. gen. |
|---|----------------|------------------|---------------------|----------------------------------|------------------------|---------------------------|----------------------|------------------------------------|--|--------------------------------|---------------------------------------|
| Gramineae..... | 39 | 13 | 13 | 4 | 7 | 4 | 4 | 12.1 | 19.6 | 8.0 | 5.2 |
| Cyperaceae..... | 11 | 5 | 1 | 3 | 2 | 0 | 1 | 4.6 | 1.6 | 6.0 | 1.5 |
| Liliaceae..... | 15 | 0 | 0 | 1 | 2 | 0 | 7 | 0 | 0 | 2.0 | 5.2 |
| Orchidaceae..... | 12 | 4 | 1 | 2 | 5 | 0 | 2 | 3.7 | 1.6 | 4.0 | 3.7 |
| Polygonaceae..... | 2 | 1 | 0 | 1 | 1 | 0 | 0 | .9 | .9 | 2.0 | .7 |
| Ranunculaceae..... | 11 | 2 | 3 | 0 | 6 | 0 | 0 | 1.8 | 4.9 | 0 | 4.5 |
| Cruciferae..... | 10 | 2 | 4 | 0 | 3 | 0 | 2 | 1.8 | 6.5 | 0 | 2.3 |
| Rosaceae..... | 13 | 1 | 2 | 2 | 11 | 0 | 0 | .9 | 3.2 | 4.0 | 8.2 |
| Leguminosae..... | 21 | 8 | 2 | 4 | 6 | 1 | 3 | 7.4 | 3.2 | 8.0 | 4.5 |
| Umbelliferae..... | 13 | 3 | 4 | 1 | 3 | 0 | 4 | 2.8 | 6.5 | 2.0 | 2.3 |
| Labiatae..... | 14 | 5 | 0 | 0 | 4 | 1 | 4 | 4.6 | 0 | 0 | 3.0 |
| Scrophulariaceae..... | 13 | 1 | 3 | 1 | 4 | 1 | 3 | .9 | 4.9 | 2.0 | 3.0 |
| Compositae..... | 43 | 10 | 5 | 5 | 8 | 9 | 12 | 9.3 | 8.2 | 10.0 | 6.0 |
| Total Dominant. | 217 | 55 | 38 | 24 | 67 | 16 | 42 | 51.4 | 62.3 | 48.0 | 50.0 |

| 40.—Continued. | Per cent. of all W. Hem. gen. | Per cent. of all N. Amer. gen. | Cosmop. per cent. of each. | Extratrop. per cent. of each. | Trop. per cent. of each. | N extratrop. per cent. of each. | W Hem. per cent. of each. | N. Amer. per cent. of each. | No. northern genera. | No. southern genera. | No. eastern genera. | No. western genera. | Per cent. of all N. genera. | Per cent. of all S. genera. | Per cent. of all E. genera. | Per cent. of all W. genera. | Northern per cent. of each. | Southern per cent. of each. | Eastern per cent. of each. | Western per cent. of each. | Per cent. of all gen. in valley. |
|-------------------|-------------------------------|--------------------------------|----------------------------|-------------------------------|--------------------------|---------------------------------|---------------------------|-----------------------------|----------------------|----------------------|---------------------|---------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|----------------------------|----------------------------|----------------------------------|
| Gramineae..... | 12.5 | 6.2 | 33.3 | 33.3 | 10.2 | 17.9 | 10.2 | 10.2 | 21 | 21 | 27 | 17 | 12.2 | 8.2 | 10.0 | 9.2 | 53.8 | 53.8 | 69.8 | 43.5 | 9.5 |
| Cyperaceae..... | 0 | 1.5 | 45.4 | 9.0 | 27.2 | 18.0 | 0 | 9.0 | 2 | 9 | 11 | 2 | 1.2 | 3.5 | 4.0 | 1.0 | 18.1 | 81.8 | 100. | 18.1 | 2.4 |
| Liliaceae..... | 1.0 | 10.9 | 0 | 0 | 6.6 | 46.6 | 0 | 46.6 | 6 | 9 | 12 | 6 | 3.7 | 3.5 | 4.4 | 3.2 | 40.0 | 60.0 | 80.0 | 40.0 | 3.4 |
| Orchidaceae..... | 0 | 3.1 | 33.3 | 8.3 | 16.6 | 41.6 | 0 | 16.6 | 8 | 7 | 11 | 1 | 4.8 | 2.7 | 4.0 | .5 | 66.6 | 58.3 | 91.6 | 8.3 | 2.9 |
| Polygonaceae.... | 0 | 0 | 50.0 | 0 | 50.0 | 50.0 | 0 | 0 | 1 | 1 | 0 | 2 | .6 | .4 | 0 | 1.0 | 50.0 | 50.0 | 0 | 100. | .4 |
| Ranunculaceae... | 0 | 0 | 18.1 | 27.2 | 0 | 54.4 | 0 | 0 | 9 | 2 | 6 | 7 | 5.5 | .8 | 2.2 | 3.8 | 81.8 | 18.1 | 54.5 | 63.6 | 2.4 |
| Ruticiferae..... | 0 | 3.1 | 20.0 | 40.0 | 0 | 30.0 | 0 | 20.0 | 6 | 4 | 2 | 9 | 3.7 | 1.7 | .7 | 4.9 | 60.0 | 40.0 | 20.0 | 90.0 | 2.4 |
| Rosaceae..... | 0 | 0 | 7.6 | 15.2 | 15.2 | 84.5 | 0 | 0 | 8 | 5 | 11 | 4 | 4.8 | 2.0 | 4.0 | 2.1 | 61.5 | 38.4 | 84.5 | 30.7 | 3.2 |
| Leguminosae..... | 3.1 | 4.7 | 38.1 | 9.5 | 19.0 | 27.5 | 4.7 | 14.3 | 2 | 19 | 11 | 10 | 1.2 | 7.4 | 4.0 | 5.4 | 9.5 | 90.5 | 52.3 | 47.6 | 5.1 |
| Umbelliferae..... | 0 | 6.2 | 23.0 | 30.7 | 7.6 | 23.0 | 0 | 30.7 | 4 | 11 | 7 | 9 | 2.4 | 4.3 | 2.5 | 4.9 | 30.7 | 84.5 | 53.8 | 69.2 | 3.2 |
| Labiatae..... | 3.1 | 6.2 | 35.7 | 0 | 0 | 28.5 | 7.1 | 28.5 | 4 | 11 | 12 | 5 | 2.4 | 4.3 | 4.4 | 2.7 | 28.5 | 78.5 | 85.7 | 35.7 | 3.4 |
| Scrophulariaceae | 3.1 | 4.7 | 7.6 | 22.8 | 7.6 | 30.7 | 7.6 | 22.8 | 5 | 8 | 7 | 7 | 3.0 | 3.4 | 2.5 | 3.8 | 38.4 | 38.4 | 53.8 | 53.8 | 3.2 |
| Compositae..... | 28.1 | 18.7 | 23.2 | 11.6 | 11.6 | 18.6 | 20.9 | 25.8 | 12 | 31 | 19 | 26 | 7.2 | 12.2 | 7.0 | 14.2 | 27.8 | 72.0 | 44.1 | 60.4 | 10.5 |
| Total Dominant. | 50 0 | 65.0 | 25.3 | 17.5 | 11.0 | 30.8 | 7.3 | 19.3 | 88 | 138 | 136 | 105 | 54.3 | 54.3 | 50.3 | 57.3 | 40.5 | 63.5 | 62.6 | 48.4 | 53.5 |

| 41. STATISTICS OF THE DOMINANT FAMILIES. <i>Specific.</i> | No. of species in valley. | Percent of all valley species. | Species of N. range. | Species of S. range. | Species of E. range. | Species of W. range. | Per cent. of all N. species in valley. | Per cent. of all S. species in valley. | Per cent. of all E. species in valley. | Per cent. of all W. species in valley. | N. per cent. of each. | S. per cent. of each. | E. per cent. of each. | W. per cent. of each. | No. of S. E. species. | No. of S. W. species. | No. of S. E. W. species. | No. of N. W. species. |
|--|------------------------------|-----------------------------------|----------------------|----------------------|----------------------|----------------------|---|---|---|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--------------------------|-----------------------|
| | | | | | | | | | | | | | | | | | | |
| Gramineae..... | 89 | 7.5 | 48 | 66 | 71 | 58 | 7.4 | 7.4 | 6.9 | 9.6 | 53.9 | 74.1 | 79.8 | 65.1 | 20 | 10 | 10 | 5 |
| Cyperaceae..... | 118 | 10.0 | 89 | 80 | 116 | 63 | 13.8 | 7.9 | 11.3 | 10.4 | 75.4 | 67.7 | 98.3 | 53.3 | 18 | 1 | 10 | 1 |
| Liliaceae..... | 36 | 3.0 | 17 | 28 | 35 | 11 | 2.6 | 3.1 | 3.4 | 1.8 | 46.1 | 77.7 | 97.2 | 30.5 | 19 | 0 | 0 | 0 |
| Orchidaceae..... | 30 | 2.5 | 29 | 16 | 30 | 13 | 4.5 | 1.7 | 2.9 | 2.1 | 96.6 | 53.3 | 100.0 | 43.3 | 1 | 0 | 0 | 0 |
| Polygonaceae..... | 23 | 1.8 | 12 | 19 | 22 | 14 | 1.8 | 2.1 | 2.1 | 2.2 | 54.5 | 86.3 | 100.0 | 63.6 | 5 | 0 | 5 | 0 |
| Ranunculaceae..... | 42 | 3.5 | 32 | 19 | 40 | 28 | 4.9 | 2.1 | 3.9 | 4.7 | 76.1 | 45.2 | 95.2 | 66.6 | 7 | 0 | 1 | 2 |
| Cruciferae..... | 30 | 2.5 | 18 | 23 | 21 | 20 | 2.7 | 2.5 | 2.0 | 3.3 | 60.0 | 76.6 | 70.0 | 66.6 | 7 | 3 | 0 | 3 |
| Rosaceae..... | 54 | 4.6 | 40 | 32 | 47 | 28 | 6.2 | 3.5 | 4.6 | 4.7 | 74.0 | 59.2 | 87.0 | 51.8 | 13 | 1 | 0 | 3 |
| Leguminosae..... | 55 | 4.6 | 17 | 51 | 37 | 26 | 2.6 | 5.7 | 3.6 | 4.3 | 30.9 | 92.7 | 67.2 | 47.2 | 26 | 12 | 1 | 2 |
| Umbelliferae..... | 22 | 1.8 | 11 | 20 | 21 | 10 | 1.7 | 2.2 | 2.0 | 1.6 | 50.0 | 90.9 | 95.4 | 45.4 | 6 | 1 | 3 | 0 |
| Labiatae..... | 24 | 2.0 | 12 | 18 | 21 | 13 | 1.8 | 2.1 | 2.0 | 2.1 | 50.0 | 75.5 | 87.5 | 54.1 | 10 | 1 | 1 | 0 |
| Scrophulariaceae..... | 32 | 2.7 | 8 | 27 | 27 | 17 | 1.2 | 3.0 | 2.6 | 2.8 | 25.0 | 84.3 | 84.3 | 53.1 | 14 | 4 | 6 | 0 |
| Compositae..... | 173 | 14.7 | 66 | 158 | 131 | 92 | 10.2 | 17.6 | 12.7 | 15.2 | 38.1 | 91.3 | 75.7 | 53.1 | 54 | 26 | 21 | 4 |
| Total Dominant..... | 727 | 61.0 | 399 | 557 | 619 | 393 | 62.1 | 62.4 | 60.5 | 65.1 | 54.8 | 76.6 | 85.1 | 54.0 | 192 | 59 | 58 | 22 |

| 41—Continued. STATISTICS OF THE DOMINANT FAMILIES. Specific. | No. N. E. species. | No. N. S. E. species. | No. N. S. W. species. | No. N. E. W. species. | No. N. S. E. W. spe's. | Per cent. of all S. E. | Per cent. of all S. W. | Per cent. of all N. E. W. | Per cent. of all N. W. | Species in valley. | Per cent. of all N. E. | Per cent. all N. S. E. | Per cent. all N. S. W. | Per cent. all N. E. W. | Per cent. all N. S. E. W. | S. E. per cent. of each. | S. W. per cent. of each. | S. E. W. per cent. of each. | N. W. per cent. of each. | N. E. per cent. of each. | N. S. E. per cent. of each. |
|--|--------------------|-----------------------|-----------------------|-----------------------|------------------------|------------------------|------------------------|---------------------------|------------------------|--------------------|------------------------|------------------------|------------------------|------------------------|---------------------------|--------------------------|--------------------------|-----------------------------|--------------------------|--------------------------|-----------------------------|
| | | | | | | | | | | | | | | | | | | | | | |
| Gramineae..... | 3 | 4 | 0 | 14 | 15 | 5.7 | 11.4 | 10.0 | 17.8 | 5.3 | 2.5 | 0 | 0 | 7.1 | 10.0 | 22.4 | 11.2 | 11.2 | 5.6 | 3.3 | 4.4 |
| Cyperaceae..... | 10 | 24 | 1 | 26 | 20 | 5.1 | 1.1 | 10.0 | 3.5 | 17.7 | 15.0 | 2.5 | 2.5 | 13.4 | 14.4 | 15.2 | .8 | 8.6 | .8 | 8.6 | 20.3 |
| Liliaceae..... | 0 | 6 | 1 | 8 | 2 | 5.4 | 0 | 0 | 0 | 0 | 3.7 | 2.5 | 2.5 | 4.0 | 1.4 | 52.8 | 0 | 0 | 0 | 0 | 16.6 |
| Orchidaceae .. . | 4 | 12 | 0 | 9 | 3 | .3 | 0 | 0 | 0 | 5.3 | 7.5 | 0 | 0 | 4.5 | 2.0 | 3.0 | 0 | 0 | 0 | 13.3 | 39.9 |
| Polygonaceae..... | 1 | 3 | 0 | 2 | 6 | 1.4 | 0 | 5.0 | 0 | 1.7 | 1.8 | 0 | 0 | 1.0 | 4.0 | 22.7 | 0 | 22.7 | 0 | 4.5 | 14.6 |
| Ranunculaceae. . . | 1 | 4 | 0 | 20 | 5 | 2.0 | 0 | 1.0 | 8.1 | 1.7 | 2.5 | 0 | 0 | 10.0 | 3.3 | 16.6 | 0 | 2.4 | 4.8 | 2.4 | 9.6 |
| Cruciferae..... | 0 | 2 | 1 | 3 | 6 | 2.0 | 3.4 | 0 | 10.7 | 0 | 1.2 | 2.5 | 2.5 | 1.5 | 4.0 | 23.3 | 10.0 | 0 | 10.0 | .0 | 6.6 |
| Rosaceae..... | 2 | 10 | 2 | 14 | 6 | 3.7 | 1.1 | 0 | 10.7 | 3.4 | 6.0 | 5.0 | 5.0 | 7.1 | 4.0 | 24.0 | 1.8 | 0 | 5.4 | 3.6 | 18.5 |
| Leguminosae..... | 1 | 1 | 5 | 1 | 4 | 7.4 | 13.7 | 1.0 | 8.1 | 1.7 | .6 | 12.5 | .5 | 2.8 | 2.8 | 47.2 | 21.8 | 1.8 | 3.6 | 1.8 | 1.8 |
| Umbelliferae..... | 1 | 3 | 0 | 0 | 5 | 1.7 | 1.1 | 3.0 | 0 | 1.7 | 1.8 | 0 | 0 | 0 | 3.3 | 27.2 | 4.5 | 13.6 | 0 | 4.5 | 13.6 |
| Labiatae..... | 0 | 1 | 1 | 5 | 4 | 2.8 | 1.1 | 1.0 | 0 | 0 | .6 | 2.5 | 2.5 | 2.5 | 2.8 | 41.6 | 4.1 | 4.1 | 0 | 0 | 4.1 |
| Scrophulariaceae..... | 0 | 1 | 1 | 5 | 1 | 4.0 | 4.5 | 6.0 | 0 | 0 | .6 | 2.5 | 2.5 | 2.5 | .7 | 43.7 | 12.5 | 18.7 | 0 | 0 | 3.1 |
| Compositae..... | 2 | 18 | 10 | 8 | 15 | 15.4 | 29.8 | 21.0 | 14.2 | 3.4 | 12.1 | 25.6 | 4.0 | 10.0 | 10.0 | 31.2 | 15.0 | 12.1 | 2.3 | 1.2 | 10.4 |
| Total Dominant..... | 25 | 89 | 22 | 115 | 92 | 54.8 | 67.8 | 58.0 | 78.5 | 41.0 | 55.2 | 56.4 | 58.6 | 61.3 | 61.3 | 26.4 | 8.1 | 8.2 | 3.0 | 3.4 | 10.8 |

| 41—Continued. STATISTICS OF THE DOMINANT FAMILIES. Specific. | N. S. W. per cent. | | N. E. W. per cent. | | N. S. E. W. per cent. | | No. extra-cont. species. | Percent of all extra-cont. species in valley. | Extra-cont. per cent. of each. | No. arboreal species. | No. shrubby species. | No. herbaceous species. | Percent of all arboreal species in valley. | Per cent. of all shrubby species in valley. | Per cent. of all herbaceous species in valley. | Arboreal per cent. of each. | Shrubby per cent. of each. | Herbaceous per cent. of each. | No. of marsh and swamp species. | No. aquatic species. | 1 per cent. of all marsh and swamp species. | Per cent. of all aquatic species. | Marsh and swamp per cent. of each. | Aquatic per cent. of each. |
|--|--------------------|--------------------|-----------------------|-----------------------|-----------------------|------|--------------------------|---|--------------------------------|-----------------------|----------------------|-------------------------|--|---|--|-----------------------------|----------------------------|-------------------------------|---------------------------------|----------------------|---|-----------------------------------|------------------------------------|----------------------------|
| | N. S. W. per cent. | N. E. W. per cent. | N. S. E. W. per cent. | N. S. E. W. per cent. | | | | | | | | | | | | | | | | | | | | |
| Gramineae..... | 0 | 15.7 | 16.7 | 30 | 9.4 | 33.7 | 0 | 0 | 89 | 0 | 0 | 8.7 | 0 | 0 | 100. | 17 | 2 | 6.4 | 3.5 | 19.1 | 2.2 | | | |
| Cyperaceae..... | .8 | 22.0 | 16.9 | 29 | 9.1 | 24.5 | 0 | 0 | 118 | 0 | 0 | 11.5 | 0 | 0 | 100. | 71 | 3 | 2.7 | 5.2 | 60.1 | 2.5 | | | |
| Liliaceae..... | 2.7 | 22.2 | 5.5 | 8 | 2.5 | 22.2 | 0 | 2 | 34 | 0 | 1.9 | 3.3 | 0 | 5.5 | 94.5 | 6 | 0 | 2.2 | 0 | 16.6 | 0 | | | |
| Orchidaceae..... | 0 | 30.0 | 10.0 | 9 | 2.8 | 30.0 | 0 | 0 | 30 | 0 | 0 | 3.0 | 0 | 0 | 100. | 23 | 0 | 8.6 | 0 | 76.6 | 0 | | | |
| Polygonaceae..... | 0 | 9.1 | 27.2 | 11 | 3.4 | 50.0 | 0 | 0 | 22 | 0 | 0 | 2.1 | 0 | 0 | 100. | 9 | 2 | 3.4 | 3.5 | 40.9 | 9.0 | | | |
| Ranunculaceae..... | 0 | 47.6 | 11.9 | 23 | 7.2 | 54.7 | 0 | 0 | 42 | 0 | 0 | 4.1 | 0 | 0 | 100. | 3 | 4 | 1.1 | 7.0 | 7.1 | 9.5 | | | |
| Cruciferae..... | 3.3 | 10.0 | 20.0 | 11 | 3.4 | 36.6 | 0 | 0 | 30 | 0 | 0 | 3.0 | 0 | 0 | 100. | 4 | 0 | 1.4 | 0 | 13.3 | 0 | | | |
| Rosaceae..... | 3.6 | 25.9 | 11.1 | 17 | 5.3 | 31.4 | 13 | 19 | 22 | 24.5 | 18.2 | 2.1 | 24.0 | 35.1 | 40.7 | 7 | 0 | 2.6 | 0 | 12.9 | 0 | | | |
| Leguminosae..... | 9.0 | 1.8 | 7.2 | 4 | 1.2 | 7.2 | 1 | 3 | 51 | 1.9 | 2.9 | 5.0 | 1.8 | 5.4 | 92.8 | 2 | 0 | .7 | 0 | 3.5 | 0 | | | |
| Umbelliferae..... | 0 | 0 | 22.7 | 6 | 1.8 | 27.2 | 0 | 0 | 22 | 0 | 0 | 2.1 | 0 | 0 | 100. | 4 | 0 | 1.4 | 0 | 18.1 | 0 | | | |
| Labiatae..... | 4.1 | 20.8 | 16.6 | 7 | 2.2 | 29.1 | 0 | 0 | 24 | 0 | 0 | 2.3 | 0 | 0 | 100. | 6 | 0 | 2.2 | 0 | 25.0 | 0 | | | |
| Scrophulariaceae..... | 3.1 | 15.6 | 3.1 | 7 | 2.2 | 21.8 | 0 | 0 | 32 | 0 | 0 | 3.1 | 0 | 0 | 100. | 7 | 2 | 2.6 | 3.5 | 25.0 | 6.2 | | | |
| Compositae..... | 5.7 | 4.6 | 8.6 | 16 | 5.0 | 9.2 | 0 | 1 | 172 | 0 | .9 | 16.9 | 0 | .5 | 99.5 | 15 | 1 | 5.7 | 1.7 | 8.6 | .5 | | | |
| Total Dominant..... | 3.0 | 15.9 | 12.6 | 178 | 56.1 | 24.3 | 14 | 24 | 689 | 26.4 | 23.0 | 67.0 | 1.9 | 3.3 | 94.8 | 174 | 14 | 65.7 | 24.5 | 23.9 | 1.9 | | | |

The statistics of the species in dominant families may be compared with the similar statistics for the total range elements. The northernness of the dominant family-element, expressed by the figures 54.8 is somewhat less than the northernness of the total species, expressed by the figures 55.6. On the other hand the southernness of the same element, expressed by the figures 76.6 is slightly in excess of the southernness of the total specific group. The dominant family-element is in like manner characterised by easternness less than is the total element (85.1—87.2) and by westernness more than is the total element (54.0—51.4). These differences are due in great part to the influence of the *Compositae*, *Leguminosae* and *Gramineae*.

In extra-continental range the dominant families fall behind the total specific element, expressed by the figures 24.3—27.0, while in NSEW range they are approximately identical with the total element. In physiognomic characters it may be noted that the dominant families fall behind in arboreal percentage (1.9—4.7) and in shrubby percentage (3.3—8.8), but lead in herbaceous percentage (94.8—86.6). Again in the habitat elements a similar variation is to be discovered, for the dominant families furnish, in comparison with the total element a smaller percentage of aquatics (1.9—4.0), a slightly larger percentage of marsh and swamp species (23.9—22.5) and an approximately equal percentage of drier-soil species. These variations from the general averages for the entire floral element are explicable through the more marked endemic quality of the dominant family species. The highly endemic character of the *Leguminosae* and *Compositae*, contributing more than two hundred species to the dominant family element, is thus reflected in the general result of the dominant family tabulations. It is precisely the two dominant families most distinctly of southern range that thus become emphasised as peculiarly endemic. The connection of this fact with earlier statements regarding the preponderantly northern intra-continental range of extra-continental species will be apparent.

Of the dominant family element, 272 species are monocotyledonous, 226, archichlamydeous and 229, metachlamydeous. Of this element, then, the Monocotyledones furnish 37.4 per cent., the Archichlamydeae 30.8 per cent. and the Metachlamydeae 31.8 per cent. Compared with the total floral element, this shows a falling off in Archichlamydeae (39.1—30.8), a slight reduction in Metachlamydeae (32.3—31.8) and a proportional gain in Monocotyledones (28.4—37.4). The strong development of the

genus *Carex* is one of the apparent causes of the variation from the general percentages, but it is interesting to see that it is the "mean" taxonomic group—that of the Archichlamydeae which suffers by reduction, to the greatest degree. While multiplicity of species is often a sign of comparative newness in a genus this multiplication may arise either in older or newer families. The monocotyledonous and metachlamydeous herbs, in their relation to the general and special tensions, have been explained in outline above. A similar explanation must be offered of the reduction of the Archichlamydeae from the dominant family position. At once in the oldest and in the youngest of the three taxonomic groups have been working the causes which tend to multiplicity of genera in excess of reduction, for these two groups are peculiarly exposed under the law of ejection. Hence they become relatively plastic and specific modifications are frequent. The third group, however, undergoes the series of changes which tend to reduction of species in excess of multiplication, and, with this reduction, the tendency is towards greater solidarity of formations and movement toward the shrubby or arboreal habit. Thus in the percentages of the dominant families further evidence concerning the difference in meaning of Archichlamydeae, Metachlamydeae and Monocotyledones, in the distribution over a limited area, is discovered.

VI. CONCLUSION.

The statistical investigation of the Metaspermae indigenous to the valley of the Minnesota having now been completed as far as the limits of this work may permit, it remains to offer some brief summary and explanation of the more important facts believed to have been determined in the preceding pages. It has been shown that while the valley of the Minnesota is geographically central in the North American continent, it is by no means botanically central, but on the contrary, strongly southern and eastern. This particularly important fact needs explanation. Upon examination it would appear that two sets of factors must be conceived as having interacted to bring about this result. These factors may be grouped as physical (in the narrow sense) and biological. Under the first head it must be observed that while geographically central, the Minnesota valley is not central in point of elevation, climate, prevailing winds, and drainage. The line of mean elevation lies to the west of the valley, the continental climatic mean, so far as concerns temperature, lies to the north of it. The winds of

the summer are pretty generally southern in their character, and there is no drainage towards the valley from the far western regions of the continent. Geologically, too, the valley has belonged, since the very early ages, to the Atlantic North American continent. Before the union of the eastern and western halves of the continent, Minnesota and much surrounding territory was formed as a portion of the eastern area. The present topography of the continent is such that a district situated as is that of the Minnesota valley must perforce receive its population of plants from the east and from the south, rather than from the west or north. It, appears, therefore, that the geographically central position of the valley does not by any means counterbalance its geological, topographical, hydrographical southeasterliness. This southeasterliness is reflected in a preponderantly southeastern metaspermic flora.

From another point of view it will be seen that the equatorial pressure of plant population tends to crowd into the valley species of southern range. This biological phenomenon may be deemed of importance scarcely second to the physical phenomena named above, as a determinant of the southeasterliness of the Minnesota valley plant inhabitants. Not only does the equatorial pressure tend to inject southern forms into the valley area, but it tends also to fill the valley with species strong on account of their southernness. As has been seen it is particularly the newest and most vigorous group of plants—the Metachlamydeae—that is characterised by a general north-bound movement. Thus, doubly, the biological conditions of plant immigration favor an extensive movement from the south rather than from the north. More plants and stronger plants may be expected from that direction than from any other. The various modifications of this general movement have already been discussed.

The two groups of causes for the southern and eastern character of the Minnesota valley plant-population will, upon analysis, be found adequate to explain the preponderance of species.

In conclusion the following tabulation is presented as a summary of the characters peculiar to each of the three taxonomic groups represented in the valley of the Minnesota. The numerals indicate the order of the importance of each group in the character in question. For example, the Monocotyledones show a larger percentage of aquatic plants than the Archichlamydeae and these a larger percentage than the Metachlamy-

deae. Therefore the Monocotyledones column contains the figure "1," the Archichlamydeae column, the figure "2" and the Metachlamydeae column, the figure "3," on the line of "aquatic plants." Thus, in the several entries, the position of each taxonomic group is indicated.

| 42. SUMMARY OF CHARACTERS OF TAXONOMIC GROUPS. | | | | 42. SUMMARY OF CHARACTERS OF TAXONOMIC GROUPS. | | | |
|--|------------------|------------------|-----------------|--|------------------|------------------|-----------------|
| | Monocotyledones. | Archichlamydeae. | Metachlamydeae. | | Monocotyledones. | Archichlamydeae. | Metachlamydeae. |
| No. of families | 3 | 1 | 2 | N.-S.-W. species..... | 3 | 2 | 1 |
| Cosmopolitan families..... | 1 | 3 | 2 | N.-S.-E.-W. species..... | 1 | 2 | 3 |
| Extratropical families..... | 2 | 1 | 3 | South-east species..... | 3 | 2 | 1 |
| Tropical families..... | 2 | 3 | 1 | South-west species..... | 3 | 2 | 1 |
| W. hemisphere families..... | 1 | 2 | 3 | South-east-west species..... | 2 | 3 | 1 |
| N. extratropical families... | 3 | 1 | 2 | No extra-continental species | 2 | 1 | 3 |
| N. American families..... | 3 | 2 | 1 | Europe | 1 | 2 | 3 |
| No. of genera..... | 3 | 1 | 2 | Asia..... | 2 | 1 | 3 |
| Cosmopolitan genera | 1 | 3 | 2 | Manchuria-Japan. | 3 | 1 | 2 |
| Extratropical genera..... | 2 | 1 | 3 | Africa..... | 1 | 2 | 3 |
| Tropical genera..... | 1 | 2 | 3 | Australasia | 1 | 2 | 3 |
| N. extratropical genera..... | 3 | 1 | 2 | West Indies..... | 1 | 3 | 2 |
| W. hemisphere genera..... | 2 | 3 | 1 | South America..... | 1 | 2 | 3 |
| N. American genera..... | 1 | 3 | 2 | Northern extracont..... | 1 | 2 | 3 |
| Northern genera..... | 1 | 2 | 3 | Southern extracont..... | 3 | 2 | 1 |
| Southern genera..... | 3 | 1 | 2 | Eastern extracont... .. | 1 | 2 | 3 |
| Eastern genera..... | 1 | 2 | 3 | Western extracont..... | 2 | 3 | 1 |
| Western genera | 2 | 3 | 1 | Not-N. extracont..... | 3 | 2 | 1 |
| No. of species..... | 3 | 1 | 2 | Not-E. extracont..... | 3 | 2 | 1 |
| Northern species..... | 1 | 2 | 3 | Arboreal species..... | 3 | 1 | 2 |
| Southern species..... | 3 | 2 | 1 | Shrubby species | 3 | 1 | 2 |
| Eastern species..... | 1 | 2 | 3 | Herbaceous species..... | 1 | 3 | 2 |
| Western species..... | 1 | 3 | 2 | Aquatic species..... | 1 | 2 | 3 |
| North-east species..... | 1 | 2 | 3 | Marsh and swamp species.... | 1 | 2 | 2 |
| North-west species..... | 2 | 1 | 2 | Drier-soil species..... | 3 | 2 | 1 |
| North-east-west species..... | 1 | 2 | 3 | Dominant family species..... | 1 | 3 | 2 |
| North-south-east species..... | 2 | 1 | 3 | | | | |

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